Salmon and sea trout

Herbert Maxwell

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THE RIGHT HON. SIR HERBERT MAXWELL, BART.
AND F. G. AFLALO

IV

SALMON AND SEA TROUT

BY THE
RIGHT HON. SIR HERBERT MAXWELL, BART.,
M.P., F.R.S.

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SALMON AND SEA TROUT

HOW TO PROPAGATE, PRESERVE, AND CATCH THEM IN BRITISH WATERS

BY THE
RIGHT HON. SIR HERBERT MAXWELL, BART.
M.P., F.R.S.

WITH ILLUSTRATIONS BY MRS. GRAHAM-MOIR, E. F. T. BENNETT, THE AUTHOR, AND OTHERS

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PREFACE

In preparing this volume on salmon and sea trout fishing, the editors have kept in view the purpose rather to present the experience of a practical angler, and the conclusions founded thereon, than to retail the precepts and instructions prescribed by other writers. Every statement in this book—every article in equipment described—every pattern of fly described—is given, except where otherwise specified, on the author's actual knowledge of them, and every theory suggested is founded on personal observation. Quotations have been admitted only where they tend to corroborate the views put forward, not from any disrespect to those who hold other opinions, but to avoid swelling the volume beyond a convenient size.

It has been a matter of careful consideration how far mention should be made of the goods supplied by various tradesmen, and whether it was desirable to reproduce explanatory figures from trade catalogues.

On the first point we have decided that, inasmuch as an angler is unable to use material

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supplied by *all* the excellent manufacturers, nothing invidious is implied by his naming those whose tackle has done him good service, and that it would be unsatisfactory if readers were not directed to establishments where they are sure to get the best quality of goods, although there are many other tradesmen able and ready to supply them of equal excellence.

The second point was more difficult to decide. It must be admitted that there is a certain weariness in recognising the same cuts in one angling work after another. On the other hand, we hope that our readers will not consist entirely of experts, but that neophytes will turn to our pages for instruction in outfit, as well as other matters. To those it cannot but be convenient to have illustrations of the various articles recommended, enabling them to dispense with reading many superfluous pages of description.

The author desires to record his sense of obligation to many persons who have assisted him by correspondence or by the loan of woodcuts. Among the former are Lieut.-Col. Haig, C.M.G., of Bemersyde, Captain Ernest Pretyman, M.P., and Mr. Archer, Inspector of Salmon Fisheries in Scotland;[1] while the latter include Mr. Horace

[1] Since this was written, Scotland has lost the invaluable services of Mr. Walter Archer, who has been appointed Inspector of Salmon Fisheries in England.

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Cox, who has permitted the use of certain illustrations from Dr. Day's *British and Irish Salmonidæ;* Messrs. W. Clowes and Son, who lent some cuts from their *Fisheries Exhibition Literature;* Messrs. Farlow and Co., Messrs. Hardy of Alnwick, Mr. Roderick Anderson of Edinburgh, and Messrs. Hutchinson of Kendal, who furnished illustrations and specimens of tackle, hooks, &c. Among those amateurs who have assisted with the camera, grateful acknowledgment must be made to the Hon. Mrs. Farquhar, Lady Maxwell, Mr. H. McMaster, and the Rev. Sir D. O. Hunter Blair.

H. E. M.

F. G. A.

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SALMON AND SEA-TROUT

CHAPTER I

THE PRESENT CONDITION AND PROSPECTS OF SALMON ANGLING IN GREAT BRITAIN

So many and various are the views entertained by salmon-anglers, that it would be easy to compose a long treatise on their craft, consisting entirely of contradiction of the statements made, and refutation of the theories propounded, by different writers. It is scarcely necessary to say that no such attempt will be made in the following pages. On those points where the results of a tolerably long experience of many rivers has brought the author into disagreement with the opinions of others, the same will be expressed by him with the utmost respect for those from whom he has the misfortune to differ, although he may feel it his duty to show how little evidence there seems to be in support of certain doctrines very commonly maintained by salmon-fishers. Perhaps it is on one point alone that complete unanimity may be expected, namely, that salmon-fishing stands at

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the head of all branches of angling; though even to this rule the proverbial exception is supplied by Colonel Thornton who, in his famous *Sporting Tour in Scotland*, recorded his exploits during a prolonged sojourn on Speyside in 1786. He greatly preferred trolling for pike to fly-fishing for salmon, and extolled it as the superior sport. This is the more extraordinary because of the far greater abundance of salmon in Scotland in the Colonel's day compared with our own. Cora Lynn thunders with the same voice as of yore, but no shoals of salmon, such as Thornton described, may be seen in the fruitless attempt to ascend it; the fine pools and streams of Clyde, once teeming with fish fresh from the sea, are barred effectually by the filth of a thousand mines and factories. A few fish still struggle up the Leven into Loch Lomond, but how sadly altered is the scene to that which the Yorkshire squire witnessed at Balloch on June 29th, 1786! Observing several salmon leaping, he prevailed on the lessee of the fishings to let him put a fly over them the following morning before the nets were drawn. The result was that he landed five salmon before 8 A.M., of which one weighed 41 lbs., and the rest from 22 lbs. to 9 lbs. "And yet," observes the Colonel, "I prefer trout-fishing."

Superiority of salmon-fishing to all other angling

It may be admitted that the use of the dry fly among chalk-stream trout, and that of the far travelling float with Nottingham reel among coarse fish, require greater delicacy of touch and keenness of vision than the salmon-fisher is ever called on to exercise. But, on the other hand, in no other kind of angling are physical endurance, presence of mind, and steadiness of nerve

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so frequently tested as in salmon-fishing; neither is the reward of success so noble. A spring salmon, fresh from the tide, safely landed with the fly and laid, perhaps, in all its glitter on a snow wreath lingering late beside a northern stream, tempts one to paraphrase the eulogy once pronounced on the strawberry by an Elizabethan worthy—doubtless had God Almighty so minded he might have made a more perfect fish, but it is certain that he never did.

In proportion as netting, river pollution and other effects of denser population have prevailed to thin the numbers of salmon, so has the popularity of the sport of salmon-fishing increased. It is of comparatively recent growth, however. Izaak Walton wrote of salmon-fishing on hearsay only. No doubt he might have practised it, had he been so minded, for the Thames and other southern rivers drew good store of sea-fish in the seventeenth century,[1] but perhaps he was prudent not to attempt

[1] The Thames remained a prolific salmon river long after Walton's day. The last salmon was killed at Boulter's Lock, near Taplow, in 1824, when the race succumbed to the combined efforts of pollution and navigation dams. But the lower reaches of the river now are far purer than the Tyne at Newcastle: twice, within the last three years, I have seen small fish (probably bleak or dace) swimming alongside the terrace of the House of Commons, and probably it requires but a sustained effort to restore the Thames as a salmon river. There are still plenty of eels in it; adult eels must descend to the sea to spawn, and young elvers ascend, otherwise the race had long since been extinct in this river. In order to lure salmon back to this river where they abounded almost in living memory, it would be necessary to conduct artificial propagation on a spirited scale. The conditions as to purity are far more favourable than when last this was attempted under the auspices of Mr. Buckland.

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it, seeing he never used a reel. Richard Franck, however, who wrote his *Northern Memoirs* in 1658, was enthusiastic about the "royal race of salmon," and was far advanced in the fastidious choice of flies, which modern sportsmen have carried to such an extravagant extent.

Great cost of salmon-fishing

To realise the esteem in which salmon-fishing is held at the present day, one has only to take into account the abundance of literature on the subject and the prodigious rents paid for such waters as afford reasonable promise of sport. The last-named circumstance constitutes the principal drawback to the sport of salmon-angling. The cost has become prohibitive except to the wealthy, and those whom the wealthy may invite to share their pleasures. Much, however, might be done by co-operation in those rivers where the radical divergence in the relative interests of upper and lower proprietors can be reconciled. Unhappily, the instances where mutual consideration and forbearance have brought about harmonious relations between these rivals are very few in number as yet. If the proprietors of the lower reaches of the river exercise their rights to the utmost, it is impossible that the proprietors of the upper reaches can enjoy what they consider a fair share of fishing. The upper proprietors justly represent that their waters, wherein are the chief spawning grounds, are essential to the stock of salmon in the river; they claim that if they are put to the trouble and expense of protecting breeding fish, a certain proportion of such fish ought to be allowed to ascend into their waters while they are still in a seasonable condition. On the other hand, the lower proprietors, having the

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netters and sea-fishermen below them, are tempted to exert their rights to the utmost, in order to secure a fair share of the spoil. In short, one is reminded forcibly in all disputes about fishing rights of the fundamental meaning of the word "rival"—*rivalis*, one dwelling on the bank of a river

The ideal state of things in managing a river salmon fishery is the formation of an angling association of all riparian owners above the tidal waters, who should forego their right of netting, but should retain the right of letting the right of angling. Those who do not care for angling would probably get far more in rent for the right to do so than their nets would ever produce. A successful instance of a river managed on these general principles is afforded by the Usk. The United Usk Fishery Association co-operate cordially with the Board of Conservators, and contribute nearly £250 a year to the expenses of watching the water. In addition to that, about £150 is subscribed from private sources; in the year 1888 (of which I happen to have the balance sheet before me) 266 salmon rod licenses at £1 each, and no less than 2,050 trout rod licenses at 1*s.* each. From these sources, and from net and putcher licenses, the Board enjoys a revenue of nearly £1,100 a year, administered solely for the preservation of the river.

The Usk

To quote the words of Mr. A. A. Williams in his evidence before the Scottish Crown Rights Commission in 1889:—

"Up to the year 1855 the fishings were let at various rents, when they got down to a very low sum indeed. Then the United Usk Association took up the preservation of the

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river, and since that time the rents have very largely increased, as well as the disposition on the part of the public to fish. *It is a much fished river as well as a good fish river.*"

Where it is possible to do so, it is of great advantage to set apart a portion of the river in which local anglers, other than proprietors, may fish on payment of a moderate contribution to the expenses of watching, &c. The considerate action of the Duke of Buccleuch in this respect is greatly appreciated by the dwellers on the Dumfriesshire Esk and Nith, in both of which rivers a liberal stretch is placed in the management of a local angling association. It is always good policy to enlist the sympathy of as many people as possible in the interests of a sport which must ever retain an exclusive character. Free fishing, both for trout and salmon, though loudly clamoured for in Scotland, means no satisfaction either to rich or poor. The favourite argument that God made fish, not for the diversion of landlords, but for the use of mankind, may be extended indefinitely. To revert to the parallel of the strawberry, God made strawberries as well as salmon; but if all strawberry-beds were thrown open to the public by Act of Parliament, how many people would get enough to make any jam?

Rivalry of upper and lower proprietors

Recognising, as every practical man must, the difficulty of effecting concerted action among the proprietors of angling rights on any river, it may seem futile to try and reconcile their interests with those of estuarine and marine salmon-fishers. As business must ever take precedence of pleasure, so the sport of salmon-angling must yield to the industry

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of salmon-netting. It is more than doubtful if foxhunters would be allowed any *locus* before a Parliamentary Committee in opposition to a railway projected through the best grass country in England. Nevertheless, the angling and netting interests being equally concerned in the maintenance of a plentiful race of salmon, this cannot be done if both parties vie in killing fish to the utmost of their power, season after season, without taking some means of replenishing the stock. Now this power of replenishment rests entirely with the inland proprietors; but except where a river and its estuary are exclusively, or nearly so, in the hands of one owner, as in the case of the Thurso, there is precious little encouragement, under existing circumstances, for riparian owners to undertake the artificial propagation of salmon. To do so would be only to increase the profits of owners and lessees of nets near the mouth of the rivers.

The Tweed

There is no more conspicuous instance of the present wasteful conduct of things than that of the Tweed. Here, if anywhere, the comparatively trifling cost of artificial propagation might be incurred in the certainty that the rents, great as they are now, which people are willing to pay for angling in this famous river, would increase in proportion to the abundance of fish. But what is the actual state of the case? Throughout the whole course of Tweed and Teviot, I know of only one small hatchery, in Lord Polwarth's park at Mertoun. Imagine what splendid results might be attained if every owner of a fishery from Hawick and Melrose down to Coldstream were to release annually from 100,000 to 500,000 young salmon! Why, the poachers of Ettrick, Gala and Inner-

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leithen might then do their worst (as indeed they are suffered to do at present), and yet the yield of the angling waters would be far beyond anything on record—but for one momentous consideration: the bulk of these fish would be taken in the nets at the mouth. The riparian proprietors might whistle *sic vos non vobis*, and certainly would soon tire of supplying the netsmen with the materials for a roaring trade.

It is a wonder that things have not become even worse than they are. The marvel is, with the improved machinery for netting, the pains taken to remove every stone that might hamper the free sweep of the net, the facilities of transport, and the constancy of the market for salmon, that any head of fish escapes to the upper waters at all. In the Tweed, practically, hardly any do so escape until the autumn. Once a splendid river for spring and summer angling, now it is only in exceptionally wet springs, like that of 1897, that weeks of constant flood carry a fair number of spring fish past the nets, and make it worth a man's while to put his rod together. In normal seasons there has ceased to be any rod fishing, except in the lower reaches at Birgham and Floors, until the nets are removed in September and the autumn fish begin to run.

The present weekly close time of thirty-six hours may allow, probably does allow, a fair number of fish to run past the nets in the tidal waters of the Tweed below St. Thomas's Island, but these only escape in order to be taken on Monday morning by the nets above the tide, between St. Thomas's Islands and Coldstream. The Royal Commission, which reported in 1896 on the Tweed fisheries, recommended, *inter alia*,

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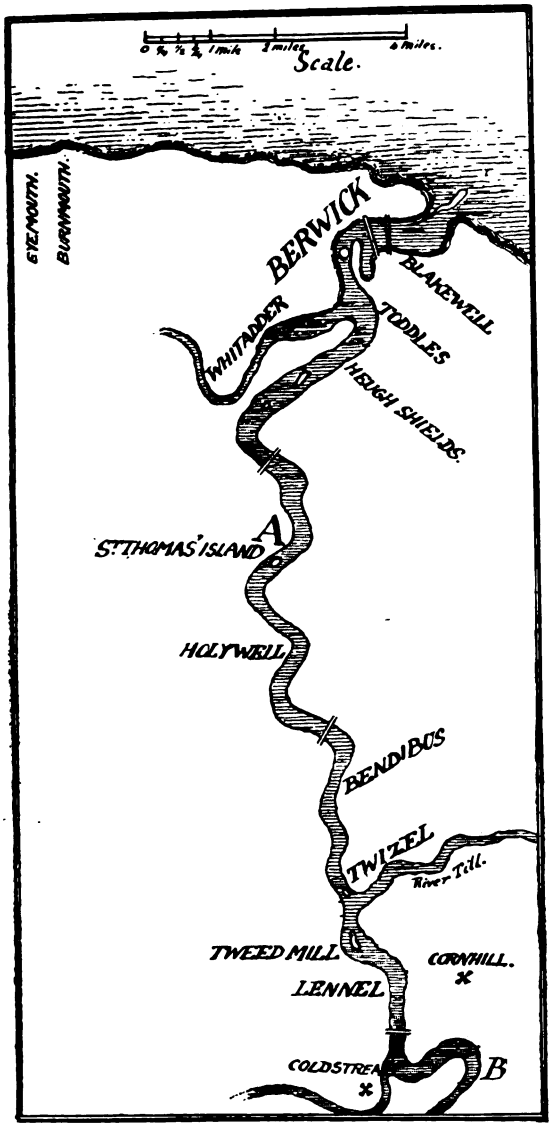

ESTUARY OF THE TWEED.

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that the weekly close-time for nets be extended to forty-eight hours; that no draft or wear-shot net be worked across the whole or three-fourths of the width of the river at any point within 100 yards of the shot of any other net; that all net fishing above the tide be prohibited; and, to counterbalance the advantage thus conferred on the angling interest, that the open season for rods should extend from March 1st to November 14th, both days inclusive, instead of as at present, from February 1st to November 30th. Were these recommendations carried into effect, their result, coupled with liberal enterprise in artificial propagation, would be to restore the Tweed to its pristine pre-eminence among British salmon rivers. But the wheels of legislation move slowly: the difficulty of carrying a contentious measure through the House of Commons is formidable enough to make any Minister hesitate to attempt it. Is it unreasonable to hope that the Tweed Commissioners may anticipate the action of Parliament by negotiating with the net proprietors for a longer weekly close time, on condition that the riparian proprietors bind themselves to release not less than, say, 1,000,000 young salmon in each year, and buy up the netting rights above the tide? The urgency of the case may be understood from the annexed sketch map, whereon are marked the obstructions through which salmon have to run at present in order to reach the angling waters. The tide flows as high as St. Thomas's Islands (*A* on map); the net fishings between that point and Lees (*B*) are valued for assessment at between £600 and £700 a year, implying the destruction of a very large number of salmon.

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The state of the Tweed has been described in some detail because it is a typical instance of a good angling river ruined, and because it has been the special subject of the latest inquiry. But the principles enunciated by the Commissioners are those which should regulate the management of all rivers. They hold that, forasmuch as it is only in rivers that angling can be done, and only in rivers that salmon can spawn, salmon should not be taken in rivers except by rod and line; while in tidal waters net-fishing should receive the utmost encouragement, subject to such restrictions as will ensure *the ascent of a proportion of every run of salmon during the open season.*

The Dee (Aberdeenshire)

In order to show that this view is sound in the interests of both net and rod fishers, two other instances may be quoted—one, of a large river, the Aberdeenshire Dee; the other, of a group of small rivers in Sutherlandshire. It will be seen from the tables (Appendix A) that since the formation of the Dee Salmon Fishing Improvement Association in 1872 value of the net fishings has risen from £6,018 to the £7,613 in 1893, although the Association spends £700 a year in consideration of the removal of the nets between Banchory and the sea. In the same period the rod fishings have increased from £1,012 in annual value to £6,298—surely a splendid result of wise administration. Since these tables were published rents have greatly risen. In 1866 the angling water of Woodend was let for £50; it is now let for £260. For the Aboyne water attached to Messrs. Cook's hotel £40 a year used to be paid; the present rent for *part* of that water is £400. While the total consignments from the remaining

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nets are equal to, or greater than, those formerly secured from a far greater number of fishing stations, the stock of fish has enormously increased, so that the Dee has become the very best angling river in the whole kingdom.

The case of the Sutherlandshire rivers (Appendix B) is not so striking at first sight; still, it is very instructive, as showing that, even with fixed engines on the coast, a fine stock of salmon may be ensured in such rivers where netting is not allowed above the tide. It will be observed that the net fishings now yield £651 in rent, against £400 in 1845, and that the rod fishings, from which no rent used to be obtained, produce £472.

The rivers of Sutherland

But the most liberal measures for artificial reproduction of salmon, and the wisest regulations for due protection of the fish, will avail nothing unless the law respecting pollutions be rigorously enforced. The longer this evil is allowed to continue, the greater will be the difficulty of dealing with it, owing to the vested interests created.

Pollution of rivers

Here is an extract from a letter from a lower proprietor on the Tweed, which has reached me at the very moment this page was being written.

"Tweed seems hopeless, no grilse and the river in such a filthy state, that I do not wonder fish not coming up. I read the other day that somewhere in Peebleshire at a meeting it was proposed to take steps to purify the Tweed, upon which one of the chief people at the meeting remarked that it was all rubbish, and the motion had better be put in the waste-paper basket. Jolly state of affairs! The river is perfectly beastly, and soon I expect fish will stop coming up altogether."

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Now this was in a season (1897) peculiarly favourable to the Tweed. All through the early months the water ran high, purifying the channel in a manner that had not been experienced for many previous springs. The Lammas floods were heavy, and were subsiding at the date of this letter, yet what a lamentable picture has to be given of this noble river! Let the Commissioners be up and doing; let them insist on the enforcement of the laws against pollution; and that the manufacturers on the upper part of the water, where the mischief is done, may be encouraged to fulfil their duty; let the lower proprietors and owners of nets ensure the passage of a fair number of fish to the higher reaches at such seasons when these fish may be worth catching.

Reference will be made hereafter to the effect of the removal of Bywell Dam on the North Tyne in 1862, whereby that river became in an amazingly short space of years the most prolific salmon river in England. Next to it in amount of produce of salmon comes the Usk, where the development arose in a similar way, by a friendly flood sweeping away an impassable weir. This was at Trostrey, about seven miles above the tide. It was a fishing weir, or cruive-dyke, as it would be called in Scotland, for which a rent of £300 a year was paid. For the fishing of ten miles above this cruel obstruction only £30 a year was received. The weir was washed away by a winter flood in 1823–4; it was rebuilt, and twenty years later the rent of the weir, with house, mill, garden and some acres of wood, had fallen to £27. A fishery association was formed; Trostrey dam was perforated to admit

Weirs and other obstructions

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the easy passage of salmon, and now it is a most productive stream, both for angling and net fishing. How profoundly were the springs of human nature plumbed by the author of Æsop's fables! Man, left to himself, will always kill the goose that lays the golden eggs. In the Usk, in the Tyne, in countless other rivers, the avidity to catch the utmost number of salmon, caused men to erect impassable barriers, so that had their object been to extirpate a noxious kind of vermin, instead of to maintain the noblest and most valuable race of fish, they could hardly have taken more effective means.

The creation of new fisheries

It is possible not only to preserve and improve, but actually to create, valuable salmon fisheries by the removal or modification of natural obstacles. In Scotland there exists a serious discouragement to this kind of enterprise in the antiquated law of Crown Rights. In England and Ireland salmon are part of the public good; in navigable waters and in the ocean all men have the right to fish for them, subject to such regulations as may be imposed by statute; in non-navigable waters the fishery becomes the property of the riparian owner. But in Scotland it is otherwise. Salmon fisheries, where they have not been bestowed on individuals or corporations by Royal Charter, remain part of the *privatum patrimonium* of the Crown, and the courts are exceedingly jealous of any infringement of this right, because, although since the fixing of the Civil List the fishery revenues are paid, not to the monarch as an individual, but into the Exchequer as part of the public income, still, when the Civil List comes to be re-adjusted on the demise of the monarch.

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the right of the Crown to valuable fisheries will have to be taken into account, and that right must not be suffered to be impaired. The man, therefore, who might spend money in enabling salmon to populate waters whence they have hitherto been excluded by falls, is deterred from doing so from the knowledge that the fishery so created, although in a river flowing through his own lands, will not be vested in himself, but will be claimed by the Crown.

There is a well-known instance of the action of this law on a certain large territory in the Highlands. The proprietor thereof possesses a charter of all the salmon fishings in a given area. By the removal of a fall a very large extent of splendid angling and spawning water could be opened up. But there exists a doubt whether the charter extends to all such fisheries as might be created thereafter, or only to those in existence at the time it was granted, and this doubt has prevailed to keep this magnificent area closed to the ascent of salmon.

But no such discouragement of private enterprise exists in Ireland, and the salmon ladder at Ballisodare may be quoted as an example of how a valuable property may be created, and excellent sport provided by the application of engineering science to natural obstacles, when these are too formidable to be demolished. The rivers Avonmore and Arrow form a junction in county Sligo, composing the Ballisodare river, which is interrupted by upper and lower falls, such as would be called a "foss" in Norway, utterly impracticable for salmon. In 1856 the proprietor, Mr. Cooper, having obtained parliamentary powers for the

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formation of a several fishery, constructed a series of ladders or fish passes over these falls. The upper or Collooney fall was the worst, though not the highest, of the obstructions, being 16½ feet of abrupt descent. After the ladders were built spawning salmon were put in above Collooney, with the result that twelve years later, in 1869, 9,750 salmon, valued at about £3,000, were taken in the fishing weir at Ballisodare. The original cost of the ladders was about £1,000, which, it will be admitted, was a moderate outlay to secure such a large income, besides the value of the sporting advantages created.

Delusions about overstocking

It is wonderful what notions get into the heads of men in connection with a subject which encourages so much abstract speculation as the habits of a migratory fish. It is not very many months since I was angling, in company with the owner of a very beautiful and still fairly prolific Scottish river. Our conversation turned on former experiences on its banks, in seasons long since gone by, when fish were far more abundant than at present. I ventured to observe how greatly the angling would benefit if an end were put to netting above the tideway. My host expressed the strongest disapproval of such an idea. He said that the river would soon get overstocked, and that disease, which manifests itself sometimes even in the present comparatively depleted condition of the stream, would commit far worse ravages. It was useless to argue, because an objection of this nature to having a good stock of fish betrayed such unfamiliarity with the normal numbers of fish in a salmon river. Not to mention those rivers on

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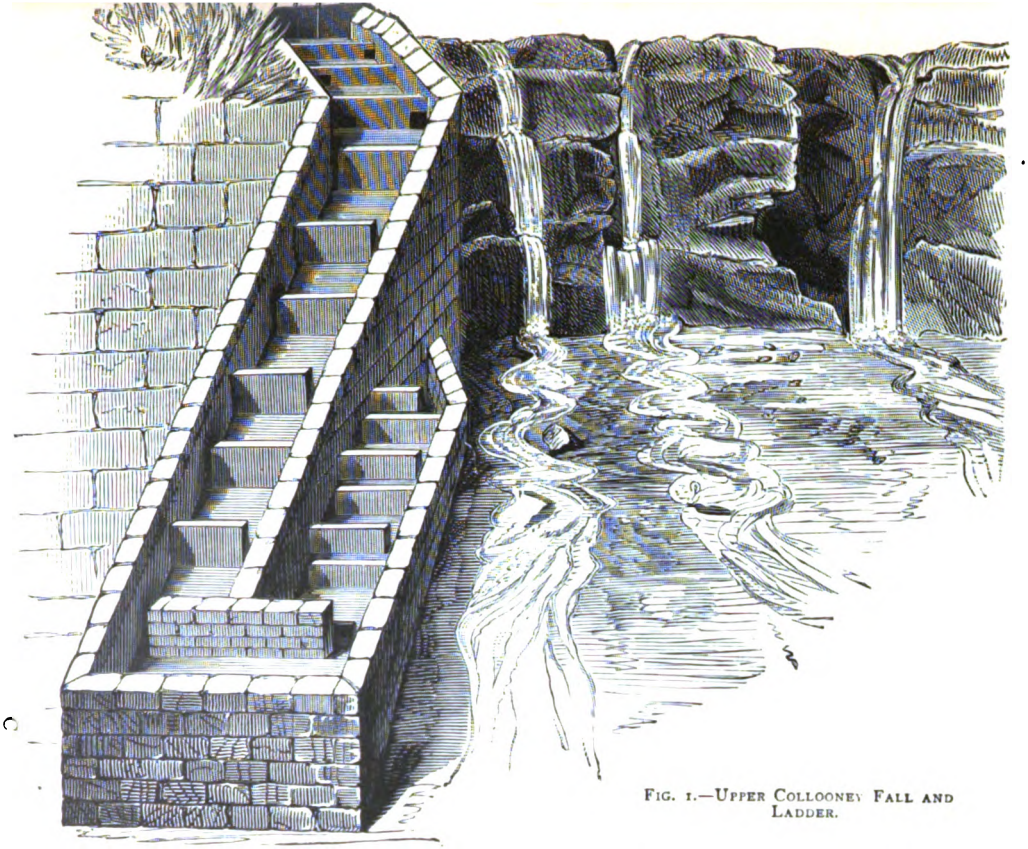

FIG. 1.—UPPER COLLOONEY FALL AND LADDER.

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the west coast of North America, into which countless hordes of salmon throng year by year, pressing up 2,000 miles from the sea, and dying by myriads after spawning, until the current flows between walls of the corpses of kelts, one has only to reflect on what takes place in those British rivers which are most nearly in a primitive condition as regards the admission of salmon.

The Thurso and Helmsdale may be taken as instances of small rivers in which no netting has been permitted for years. In favourable seasons salmon ascend these streams in numbers far beyond anything I have ever seen in any other Scottish river of similar volume. In neither the Thurso nor the Helmsdale, I am informed, has a single case of *saprolegnia* — the dreaded salmon disease—ever been detected. This disease is sometimes attributed to pollution of the rivers by manures used in agriculture. It is true that the absence of cultivation might be alleged as the cause of the immunity enjoyed by the Helmsdale fish, but the same would not apply to the Thurso, which, from Westerdale down to the sea, flows chiefly through arable land.

Of course, if disease visits a river very full of fish it will destroy many times more than it will do in a river where fish are scarce—a straggling survival of the ancient shoals which once teemed in its pools. But in view of the almost continuous chain and network of snares round the whole coasts of the British Isles, it is idle to talk of an overstock in any one river under existing conditions, or to attribute the prevalence of disease to excessive numbers of salmon.

Another delusion, hardly less mischievous or

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TORRISH, HELMSDALE.

To face p. 18

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FIG. 2.—PLAN AND SECTION OF UPPER COLLOONEY LADDER.

C 2

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widespread, is that which causes people to advocate the repeal of that provision in the salmon laws which affords protection to kelts.[1] Previous to this enactment, all kelts that came to the hook were killed, though it is difficult to perceive what satisfaction could be derived from doing so, for they are tasteless and probably unwholesome food. The notion has often found utterance in evidence before Royal Commissions and Parliamentary Committees that the salmon disease originates among kelts lingering late in the rivers, detained by low water or obstructions from descending to recruit in the sea. Such an opinion rests on the vague belief that *Saprolegnia ferax* is a spontaneous growth, an idea which hardly deserves to be seriously disputed in the present state of bacterial science. *Nullum vivum sine vivo:* saprolegnia can no more arise independently of parentage than can oaks or pineapples. If there are no bacilli of saprolegnia in the water, as seems to be the case in the Thurso and Helmsdale, kelts may and do hang about the pools till June, and they will not contract the disease; but if the bacilli be present, as is probably the case in most waters, kelts undoubtedly will be peculiarly liable to succumb to their attacks, owing to their emaciated condition. But to destroy kelts lest they should contract the disease and communicate it to clean fish ascending from the

The protection of kelts

[1] Kelt is the commonest name for unseasonable salmon descending to the sea after spawning. They are known in Ireland as slats, and in some English and Scottish rivers as liggers and marks. Early in the season they usually retain some of their autumnal coppery or iron-grey hue, but, as the spring advances, they become exceedingly bright.

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sea, is a most perverse and short-sighted policy. Let diseased fish be taken out and buried or—better—burnt, but in the name of common sense let all healthy salmon (and kelts are salmon) which have escaped the innumerable perils of adolescence be respected at such times as they are unfit for human food.

There is greater plausibility in the allegation that such large numbers of parr or samlets are devoured by voracious kelts while both are descending to the sea, as to make it of more importance to the stock of salmon to sacrifice the mature fish when unseasonable, than to preserve them in order that they may return after their sojourn in the ocean. But the destruction wrought by kelts among the young of their own species probably is not so great as is commonly believed. No doubt a good many do fall victims, but a little observation and reflection will show that kelts do not enjoy many opportunities of catching parr. The kelt lies habitually in water of considerable depth, from three feet deep, say, to twenty, and nobody with experience of their habits, supposing him to desire to hook kelts, would look for them elsewhere. But if it were desired for some reason to catch parr—the yearling samlets—where should the flies be cast? Not assuredly in the places frequented by mature fish, whether clean or unclean, but on the shallow fords and rapids where salmon never remain. The parr, of course, in making their first migration seawards must run the gauntlet of all large fish which may be in the pools they pass through, unless instinct guides them to keep close to the banks; but young and old fish do not habitually frequent the same parts of the rivers.

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A word about the treatment—too often inhuman—of such kelts as the angler may bring to land during the spring months. No language can be found too harsh to condemn the practice of gaffing them which prevails in some rivers. It is brutally cruel, and it is the duty of every sportsman sternly to forbid it. There is not the slightest excuse for it, because as soon as a fish is seen to be foul, it is perfectly easy to haul him ashore by taking in the line hand over hand; it is unworthy of any one pretending to the chivalry of sport to content himself by complying with the letter of the law in returning a kelt to the water, heedless of the nature of the wound inflicted on a noble fish suffering under temporary eclipse. Indeed, it would be a great improvement if the use of the gaff were prohibited altogether during the spring months, as it is in the Helmsdale. Even where the gaff is not used in landing kelts, they are often subjected, through ignorance and carelessness, to injury by rough handling. The angler is apt to be the reverse of amiable when kelts are plentiful and clean fish scarce. It is not always an easy task to extricate the fly from the jaws of a slippery, struggling creature when the fingers are stiff with cold; and gillies often facilitate the process by kneeling on the unfortunate fish, regardless of the lesions that may be caused in delicate internal organs. It behoves all sportsmen to treat with scrupulous care an animal from which, when in a state of robust health, so much keen enjoyment is derived, and to facilitate his progress to the recruiting ground, whence, it may be hoped, he may return in season, greatly increased in strength and weight. With

Cruelty to kelts

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the utmost care, a proportion of the kelts hooked succumb to their injuries. A wound in the gills is mortal, and if, as sometimes happens when fishing with large hooks, that organ should be injured, the best thing to do is to knock the fish on the head, and leave him for the hoodie crows.

I desire to record my earnest conviction that a great mistake will be perpetrated if ever the legal protection afforded to kelts is withdrawn: not only will the interests of sportsmen suffer by the diminution in the numbers of heavy fish, but the fishing industry also, by the useless destruction of great numbers of fish which have attained maturity. It is easy to replace a hundred fold—a thousand fold—the samlets destroyed by kelts, by resorting to artificial propagation, but no means can be taken to ensure any one of them escaping the manifold perils it has to encounter before it can ever attain to the state of kelthood.

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CHAPTER II

EQUIPMENT

A GREAT deal of the earlier treatises on angling is taken up with instructions to the sportsman how to construct his own rods, lines, and other tackle. The oft-quoted *Boke of St. Albans* contains the following directions for rod making:—

Home-made tackle

"Ye shall kytte betweene Mydhelmas and Candylmas a fayr staffe, of a fadom and a halfe longe, and arm-grete, of hasyll, wyllowe or ashe; and beyth hym in an hote ouyn, and set hym euyn; thenne, lete hym cole and drye a moneth. Take thenne and frette hym faste (tie it tight) with a coeke-shote corde; and bynde hym to a fourme, or an euyn square grete tree. Take thenne a plummer's wire, that is euyn and streyghte, and sharpe at the one ende; and hete the sharpe ende in a charcole fyre tyll it be whyte, and brenne the staffe therwyth thorugh, euer streyghte in the pyth at bothe endes, tyll they mete; and after that brenne hym in the nether ende wyth a byrde-broche (bird spit) and wyth other broches, eche gretter than other, and ever the grettest the laste; so that ye make your hole aye tapre well. Thenne

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lete hym lye styll, and kele two dayes; unfrette hym thenne, and lete hym drye in a hous roof, in the smoke, tyll he be thrugh drye. In the same season take a fayr yerde of grene hasyll, and bethe him euen and streyghte, and lete it drye with the staffe; and whan they be drye, make the yerde mete unto (fit into) the hole in the staffe, unto halfe the length of the staffe; and to perfourme that other halfe of the croppe, take a fayr shote of blacke thornn, crabbe tree, medeler, or of jenypre, kytte in the same season and well bethyd and streyghte, and frette theym togyder fetely, soo that the croppe maye justlly entre all into the sayd hole; and thenne shaue your staffe, and make hym tapre well; thenne byrell (ferrule) the staffe at both endes wyth long hopis of yren or laton (tin), in the clennest wise, wyth a pyke at the nether ende, fastynd wyth a rennynge byce, to take in and out your croppe; thenne set your croppe an handfull wythin the ouer ende of your staffe, in suche wyse that it be as bigge there as in ony other place about; thenne arme your croppe at the ouer ende, downe to the frette, wyth a lyne of hy heeres, and dubbe the lyne, and frette it faste in the toppe wyth a bowe to fasten on your lyne; and thus shall you make you a rodde soo preby, that ye may walke therwyth; and there shall noo man wyt where abowte ye goo."

Less bewildering are Baker's instructions, a couple of centuries later, to make the rod "of a hazel of one piece, or of two pieces set together in the most convenient manner, light and gentle." For salmon, the butt was to be 10 feet long, and the top 6 feet, "pretty stiffe and strong." Richard Franck, though even less explicit than Baker about the salmon rod, insisting only that it should be

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"rush-grown, and be sure it be streight and plient," was very meticulous in the matter of flies, and careful to recommend the hair of a "stone-horse" for the casting line. Then Izaak Walton, being a bit of a sybarite (for which Franck heartily despised him), troubled himself very little about the manufacture of tackling, and recommended his pupil to "Mr. Margrave, who dwells among the booksellers in St. Paul's Churchyard, or to Mr. John Stubs, near to the Swan in Golding Lane: they be both honest men and will fit an angler with what tackling he lacks." At this time of day, therefore, there is no occasion to burthen these pages with directions for the construction of rods and tackle; there are plenty of "honest men" to supply them ready-made and of the best. Indeed, the difficulty is not to find admirable material for anglers, but to recommend a selection from the number of ingenious inventions. No one man can make use of them all; he can only describe those which he has found serviceable in his own experience. Nor is there any advantage to be derived from the ascetic example of "Cosmopolite,"[1] who, in his entertaining *Sportsman in Ireland*, published nearly sixty years ago, recommends his readers to do as he did in preparing for a prolonged foray among the rivers and loughs of the west. He bought in Cork "a good tie rod, and a large reel that will contain 150 yards of stout hemp line, well twisted. It should be soaked in oil and beeswax well melted, then stretched and reeled." For such a line he paid the round sum of one shilling, but goodness knows what excruciating trouble he brought upon those who may have fol-

Early tackle shops

[1] Robert Allen, Serjeant-at-Law.

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lowed his advice, and soaked twine in oil and bees-wax (proportions not mentioned)!

All the comfort and not a little of the success of the salmon-fisher depends on his rod being adapted to his strength and suited in size to the water in which he has to fish. The beginner, therefore, who is putting together an outfit for the first time, should stipulate for a trial of the article selected, on the understanding with the maker that if the first choice is not satisfactory, the rod shall be exchanged for another. There are plenty of rod makers in the first class, and there is no possible excuse for saving half-a-sovereign or two by going to any other, because, although one *may* get a good article from a cheap tradesman, he is *certain* to get it from one with a reputation to lose. Every part of a salmon rod is sure to be tested to the utmost, not only in the encounter with the most powerful sporting fish that swims (in proportion to its weight), but still more by the strain of casting a long line, sometimes in violent winds. A usual length for a salmon rod is 18 feet; it is seldom that any advantage is obtained by using a longer one, especially by men of not more than average strength and stature; and some excellent anglers recommend 17 feet as a better general size, because what is lost in length of casting is gained in ease to back and arms. I myself, though of not more than medium height and muscle, prefer 18 feet in all but the smallest rivers. Even in streams where most of the water can be covered with ease, there are generally places in which a long cast is necessary, and one is never happy if such places have to be fished imperfectly or not at all. There comes to mind an example of this in my own ex-

The rod

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perience. I was fishing not many years ago in the Minnick, a charming little river which joins the Cree some miles above Newton Stewart. It is a rough-and-tumble water; most of the casts may be compassed with a 15 or 16-foot grilse rod, and on this occasion I had borrowed a friend's 16-foot split cane. I had landed three fish out of the various pots and ledges which occur in the rocky channel, when I arrived at a pool of more stately dimensions. The water was heavy; a strong stream ran on the far side, and beyond the stream, between it and a steep clay bank, several fish were showing themselves. Pushing in as far as my thigh-waders would allow, I was able to cover some of them; twice or thrice fish turned at the fly, but the swift stream snatched it away so quickly that they missed it. A couple of feet more length in the rod and I could have hung the fly nicely beyond the stream; as it was, though these salmon meant business, they were balked and I had to leave them.

In playing a fish from the bank, one is often grateful for a full-sized rod, by which the line may be lifted over rocks and other obstacles in mid-channel and disaster thereby be averted. But in fishing from a boat in a large river or in a lake, a shorter rod will serve every purpose, with greater ease to him who has to wield it.

Besides the length of casting required, there is another consideration which greatly affects the weight of a rod. In certain northern rivers, early in the season, it is necessary to use very large flies, three or four inches long, with tackle heavy in proportion. In order to give the strength needful for the recovery and delivery of a line weighted

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with such a large hook, the rod must be made so powerful in the top joint as to feel top-heavy in hand. To work such a rod through a long day involves a degree of fatigue quite unnecessary at a season when smaller flies and lighter tackle come into use. I possess a favourite greenheart rod by Farlow, made specially for heavy work in the spring. I had been fishing with it for some weeks in the Thurso in January and February, 1896. At that season, in that northern latitude the days are very short, which is well for the angler who has to cast enormous flies on thick treble gut in a climate frequently most boisterous. After leaving Thurso, I had occasion to borrow a friend's rod made by Blacklaw, of Kincardine O'Neil, with which I fished one afternoon in the Cree, using a small fly and single gut. So different was the poise of this rod that, when I got home, I observed to my friend "That is a sweet little rod of yours." "A *little* rod!" said he. "Why, how long do you think it is." I said I supposed about 17 feet, and was incredulous when he assured me it was 19 feet, until we applied the foot rule, and found that it was so: that is, one foot longer than the rod I had been using in the north. Each of these rods was made of greenheart throughout; each was perfectly adapted for its own kind of fishing, and would have been unsuitable for the other.

Few anglers trouble themselves nowadays with splice fastenings to the joints, though at one time their superiority over the convenient socket and ferrule was held to be an article of orthodox belief. It is true that once a splice-jointed rod is fitted together it is a few ounces lighter than one with metal fittings; and the man who is lucky enough

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to live beside the river he fishes will find advantage in using one, being able to hang it up at the close of each day. Champion casters, too, find they can get the best results out of a spliced rod, especially if it is strengthened by thickening the wood at the splices.

But considering that most men have to travel in search of sport, and, even when they have taken up their fishing quarters, generally have to drive some miles to the different beats, there can be no comparison in convenience between a ferruled rod and a spliced one. Salmon are not caught by champion casting; it is desirable, indeed, in some special cases to get out some thirty odd yards of line, but that is very exceptional. Just as far the greater majority of birds are shot within 40 yards, so ninety-nine salmon out of every hundred are raised and killed with not more than 25 yards off the reel. The ferruled rod must be a poor one that will not execute that with sweetness and precision, whether the joints are fitted with the old pattern of socket joint with Messrs. Hardy's spiral lock-fast joint (Fig. 3), or Mr. R. Anderson's patent capped ferrule (Fig. 4).

Both these last are great improvements on the old socket joint, at least for trout and grilse rods; in the largest size of rods they have the disadvantage of adding appreciably to the weight. Whichever kind is selected ought to be regularly greased with vaseline to prevent sticking. If, in spite of this indispensable precaution, the joint does stick, which it may do at times in heavy wet, refrain from violent twisting and pulling, which may cause irreparable damage, especially to a split cane rod. Obstinate cases will generally yield to gentle warmth. Turn the metal ferrule

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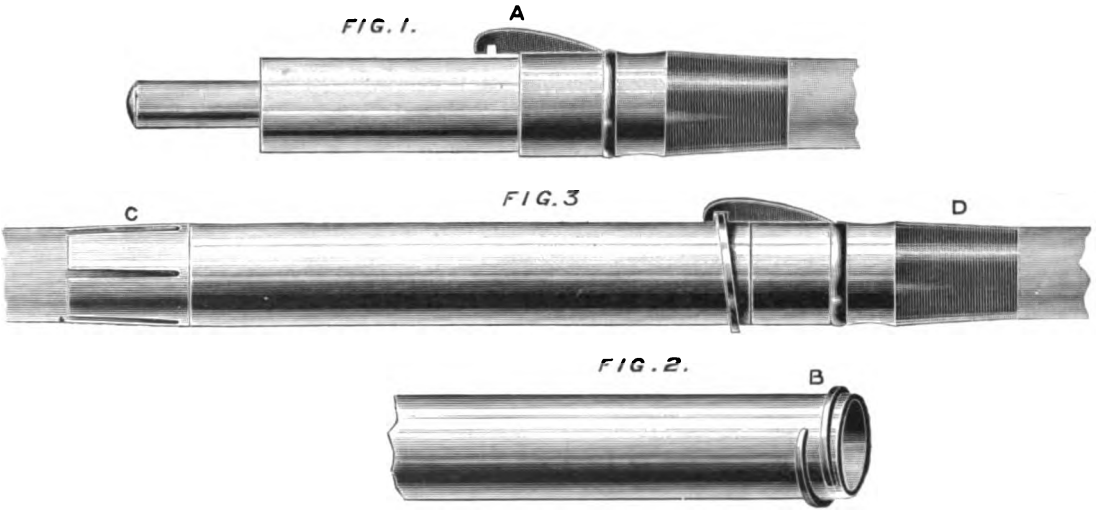

FIG. 3.—HARDY'S PATENT LOCKFAST JOINT.

Fig. 3 is the joint fixed, the continuation and splint ends of ferrule is shown at C before binding, and at D as finished. Fig. 2 Is the female part of joint before fixing, showing spiral B. Fig. 1 being the male part, showing hook at A. To fix the joint Fig. 1 is pushed into B, when A engages with B and half a turn closes. The reverse action forces the joint apart.

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slowly over the flame of a candle, rapping it softly with the handle of a knife, and in nine cases out of ten this treatment will prove effective. In the tenth case, creosote must be applied to the joint and allowed to soak down; it is far more penetrating than other oils, and effects an easy severence. If the old slip ferrules or socket joints are used, the wire loops must be carefully lashed together with a piece of old salmon line. Let this be permanently attached to the *thicker* ends of the middle and upper joints, where they can be seen on untying the top of the rod cover.

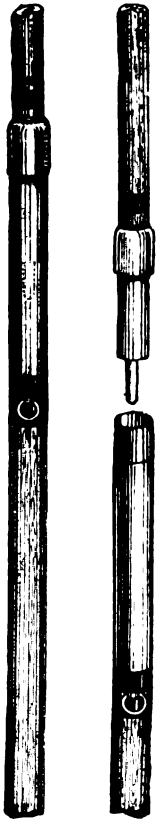

FIG. 4.—MR. R. ANDERSON'S PATENT CAPPED FERRULE.

One thing is of prime importance in salmon-fishing, namely—never to go out without a spare rod within easy reach. The force required to recover a long, heavy line from the water is considerable; a check at the moment the fly is withdrawn, whether from a fish or sunken rock, is very apt to cause a smash; and even in delivering a cast, though the force required is less than that in the recovery, the soundest greenheart will snap some times without any fault on the part of the angler, especially on a gusty day. A fracture takes a long time to repair; a bent ferrule is practically irre-

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parable on the spot; in either case it is distressing to find that your spare rod has been left at home, perhaps many miles away.

I have never forgotten the lesson learnt in a day's fishing on the North Tyne in 1867. I had come some miles by train to Reedsmouth Station, whence I walked down to the Hargroves water. I was alone. I had not brought my gaff, and the river was very heavy, but I soon got among fish, and landed eight salmon and two grilse, weighing in all 90 lbs.—nothing above 13 lbs. Each fish had to be towed ashore and tailed out, which is apt to be severe on the rod. It proved so in this case, for I broke my only top *three times*, and had to sit down and repair it twice: the third time darkness closed upon the scene. Oh, the precious moments wasted! Oh, the trembling fingers that bound the twine of sandwich papers so clumsily round the fractures! Oh, the want of foresight or the laziness that made me bring out only one rod! Perhaps it was no worse than want of experience—for one does not learn everything in a season or two. You may carry your second rod day after day, year after year, and never have occasion to take it out of its case, until one fine fishing day something happens which will make you realise the advantage of making a good rule and *keeping it*.

Beautiful pieces of handiwork are the split cane rods which have come into favour of late years, and admirably they do their work in casting a fly and in playing a fish; but it is very doubtful if they possess enough advantage over good greenheart to balance their far greater costliness. In trout-fishing, especially with dry fly, split cane is without doubt the very best material that can be used;

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but in the larger sizes of salmon rod, it is not easy to discern any superiority that split cane possesses over greenheart, except perhaps in appearance, and the cost is at least three times as great. Nor, indeed, is there any peculiar merit in split cane for smaller rods of 15 feet in length, such as may be used for grilse or sea-trout, or in boat-fishing for salmon. The most that can be claimed for them justly is that a good split cane is quite as serviceable and trustworthy as a good greenheart. Let each man please himself in the matter; if he chooses to give ten or twelve guineas for a split cane salmon rod, instead of three or three and a half for a greenheart, nobody but his wife has any right to complain.

The process of constructing the best split cane rods is shown in the various sections exhibited in

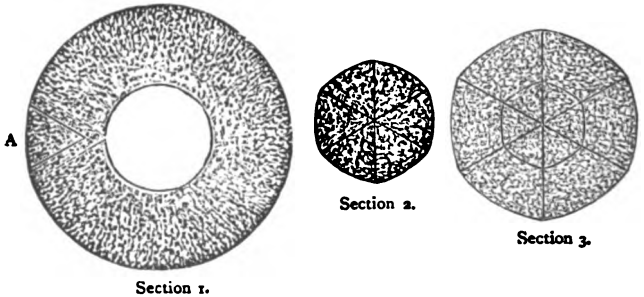

FIG. 5.—SECTIONS OF DOUBLE AND SINGLE BUILDING.

Figs. 5 and 6.[1] Section 1 is cut through a selected piece of cane. At A is shown the manner of cutting triangular strips out of the skin, in which all the strength lies. If the rod is a small one it

[1] These figures have been supplied by the kindness of Messrs. Hardy Brothers, of Alnwick.

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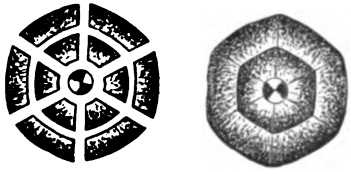
may be built single, by cementing the triangular strips together as shown in Section 2. But in salmon rods the building must be double as shown in Section 3, in which will be seen twelve distinct sections—six within six. Still greater strength is obtained by the use of a hardened spring steel centre shown in Fig. 6. The steel core is coated with a protective material to repel rust, and Messrs. Hardy claim that a salmon rod built in this way is practically indestructible.



Before Cementing. After Cementing.

FIG. 6.—STEEL CENTRED SPLIT CANE.

Any really good rod will last very many seasons if it is properly used and taken care of. When not in use, it should not be tied too tightly into its cover, lest the pieces should be bent; it should be laid flat or placed erect in a rack, and kept in a cool dry place, such as a coach house. The air of a room artificially heated is apt either to make the wood brittle, or to cause it to shrink from the metal fittings. It should receive a coat of varnish from time to time, which is best applied by the maker, and it is an excellent thing to give it a good rubbing over with vaseline occasionally.

Greenheart salmon rods are apt to be too thin in the butt to be pleasant to grasp through a long day's fishing. It adds not a little to the angler's comfort if a grip or hand-piece is added in the shape of a sheathing of cork. The rod for heavy work ought always to be fitted with standing fixed rings (Fig. 7), instead of those hanging loose to a

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strip of metal. I prefer these to what are termed "snake" rings, because the length of the attach-

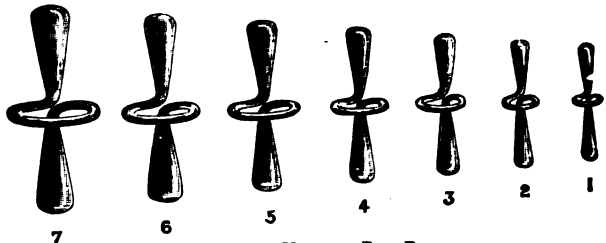

FIG. 7.—STEEL UPRIGHT ROD RINGS.
Hardened steel, and lacquered to prevent rust.

ment is not so great as to interfere with the flexible play of the rod.

There is a considerable variety in reels, but nobody can go wrong in selecting one by a good maker, deep in the drum and with a simple ratchet check to avoid overrunning. The difficulty is to get a check of suitable, uniform pressure. If it is too light, the line is apt to over-run and get jammed, which brings about disaster with a lively fish. On the other hand it is obviously undesirable to have too much resistance in the check. The most perfect salmon reel which I have ever used is Messrs. Farlow's patent lever, which carries a regulating screw on

The reel

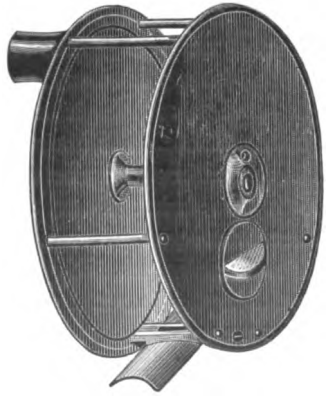

FIG. 8.—FARLOW'S PATENT LEVER SALMON REEL.

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the revolving plate by which the check can be adjusted to any degree of stiffness that may be desired (Fig. 8). These cost from 42*s.* 6*d.*, with a diameter of 3½ inches, to 70*s.*, with a diameter of 5 inches. If lightness is desired they can be had in alloyed aluminium, costing about 25 per cent. more. Such a reel, large enough to carry 120 yards of plaited silk line, weighs only 14½ oz.

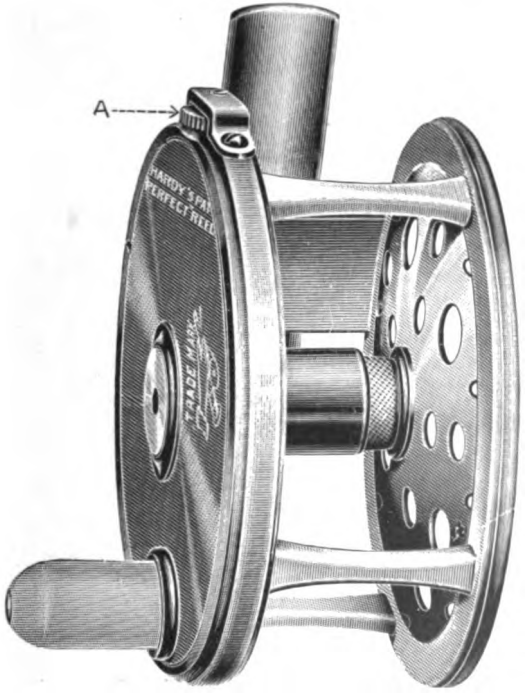

FIG. 9.—HARDY'S PATENT "PERFECT" REEL.

Messrs. Hardy, of Alnwick, have designed a reel of which I can only speak from hearsay, but those who have used it declare that the title it bears—the

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"Perfect"—involves no exaggeration. It runs on ball bearings and is made of alumin, an alloy of aluminium, weighing very slightly more than the pure metal, and far stronger. The reverse plate is perforated, whereby damp is allowed to evaporate from the line, and above the handle plate is a screw to regulate the pressure of the check (Fig. 9). These reels are produced at a wonderfully low price; one with a diameter of 3½ inches, weighing 12½ oz., costs 35*s.*; with a diameter of 5 inches, weighing 27 oz., costs 60*s.*

A good reel is worth taking care of and should be kept in a case, either of solid leather, or leather

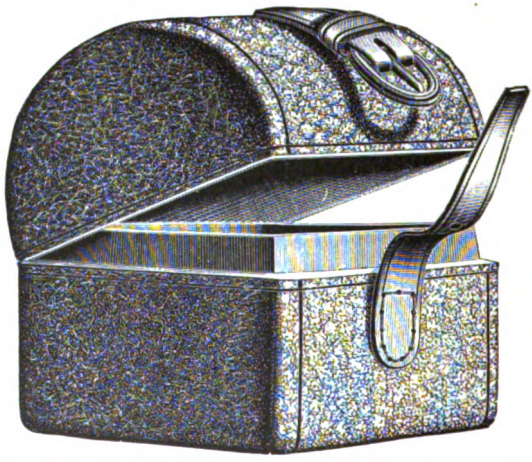

FIG. 10.—REEL CASE.

covered and velvet lined, such as is shown in Fig. 10, sold by Messrs. Hardy, of Alnwick, for 10*s.* or 12*s.* I am still using a reel which I bought from Paton, of Perth, some thirty years ago, made partly of wood and partly of metal. I wish I

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could be sure there was as much fun in store for me as I have enjoyed with that venerable instrument.

Never be so credulous as to be tempted by cheapness in this most vital part of your armament. A cheap reel is sure to play you false sooner or later, perhaps at a critical moment.

In attaching the reel to the rod, it is important to place it so that the handle be to right when the rod is held with the reel uppermost. This is contrary to general practice, I suppose, because I have observed that keepers and others, if you leave one of them to put on your reel, invariably attach it so that the handle is to the right when the rod is held with the reel below it. But there is a great advantage in playing a fish with the reel uppermost. The line then lies along the rod and not on the rings; neither line nor rings are worn by friction and the strain is more evenly distributed along the rod. In casting and working the fly the reel is below the rod, and it is good to reverse this position when playing a fish, so as to counteract the tendency of the wood to bend in one direction more than another.

The nature of the angler is twofold: sometimes he shows himself intensely conservative, but he is also greatly, almost credulously, inclined to innovations. It is amusing to read in some old angling works the praise of horsehair lines, and warnings against the new-fangled mixture of horsehair and flax or silk. Horsehair! those of us who are old enough may recollect the charming behaviour of a line composed entirely of that material: how it unwound off an old-fashioned, long-barrelled, shallow reel, and lay like an elongated

The line

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ringlet on the surface of the water. Horsehair, once indispensable to the angler's outfit, now forms no part of it. For salmon and trout, reel-lines are now made entirely of plaited silk, with waterproof dressing, beautifully flexible and heavy enough to go out straight and true. Some use tapered lines, which are reckoned specially good for switching or underhand casting; but for ordinary purposes a plaited silken line, even from end to end, is hard to beat. Such lines are costly—from 3*d.* to 4*d.*, and even 6*d.* a yard, or 25*s.* to 35*s.* for 100 yards. The Manchester plaited waterproof cotton lines are well spoken of by those who have used them; they are said to be durable, flexible, and good to cast, and only cost one shilling per 10 yards. Another method of economising in lines is to use 40 or 50 yards of silk line, spliced to a back line next the reel of cheaper material. Very light and strong flax lines of great length are used in tarpon fishing with ample security; these make admirable backing, occupying very little room on the reel. It is certainly an advantage in rivers where fish run wide and wild to avoid unnecessary weight in the bulk of the line, retaining, however, some 50 yards of heavy stuff for casting.

Silk has but one drawback besides its expense: it is very liable to rot unless the wet part of the line is carefully pulled off the reel and hung up to dry immediately after returning from each day's fishing. In Fig. 11 is represented a very handy collapsible line drier, supplied by Messrs. Farlow at a moderate price, which may be put together in a few minutes and screwed to a table. The upper part of the clamp is arched to receive the scoop of the reel, and the advantage of using this

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machine is that kinking or tangling is rendered impossible.

Besides being carefully dried after each day's fishing, all lines should be tested periodically from end to end. I once nearly lost a good fish from the reel line parting. I had hooked him in a wide stream of the North Tyne, and he had ploughed away to the far side, taking out some 30 yards of line, making, in addition to what I had been casting, between 50 and 60 yards off the reel. I had a good strain on him, when, suddenly, there came a slight snap, and, to my horror, I beheld the broken

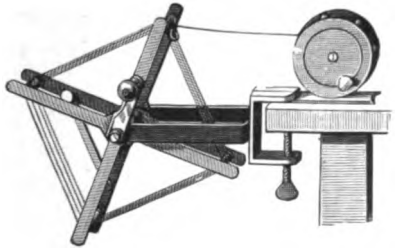

FIG. 11. – FARLOW'S COLLAPSIBLE LINE DRIER.

end of the line running up through the rings. It fell in the water at my feet, where I seized it, throwing the rod to my attendant and bidding him to run up the line afresh. This done, I knotted the two ends together above the top ring and set to work again at the fish. Play him I could not, for I could not shorten the line because of the knot. There was a wood behind me which prevented my going back from the river, and for two mortal hours that fish played *me* at the end of the long line, till at last he swam within reach and was landed— 26 lbs., the heaviest fish I ever killed in that fine

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river. It was a bungling performance, however, and is only mentioned here in order to explain what ought to have been done under such circumstances. It happened a long time ago, before I had learnt what a simple business it is generally to hand-line even a strong fish. Kelts, especially, ought always to be landed by catching hold of the line as soon as they show the slightest signs of exhaustion, and towing them ashore, thereby saving a good rod from unnecessary strain. Hand-lining would have brought to bank that 26-pounder in ten minutes, and a good fishing afternoon would not have been wasted.

Between the reel line and the fly comes the casting line, attached to the reel line either by a loop at the end of each, which is greatly preferable to any other way, or by some kind of hitch knot, which, though convenient, is objectionable as interfering with the smoothness of the line throughout. The casting line ought to measure three yards in all, and these are usually sold ready made up of that length, either all treble twisted gut, half treble and half single, or all single. It is, however, far better to have them made in separate lengths of a yard and a half, all treble of various strengths or all single, and the angler, by looping these lengths together can adapt the fineness of his casting line to the season and the water. Thus to make a casting line for heavy spring fishing, a yard and a half of strongest treble gut may be attached to the reel line, and then a yard and a half of finer treble gut looped on to receive the fly. In like manner, for fine summer fishing a cast of fine treble gut and single gut may be made up.

Gut

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Gut is a beautiful, but somewhat treacherous material, being very perishable, and the strongest threads are apt to nick if bent at an acute angle. Many good anglers entertain a prejudice against treble gut, but I am only recording the results of my own experience in advocating it for all except very fine waters. It can be twisted of a very small size, and in making it up into a cast, the ends can be woven together so as to avoid knots altogether, making a beautifully elastic line, hardly more visible to the fish than strong single gut. Even among those who prefer treble gut, there will be many who disagree with me in preferring machine-twisting to hand-twisting. Nevertheless I do so; first, because machine-twisted lines are much neater than hand-twisted, and second, because they can be made entirely without knots. Many and many a fish have I lost through fracture of the best single gut, but not one, so far as memory serves, through the failure of treble gut. It would save much trouble and vexation if all single gut lines were burnt at the end of each fishing season; but those of treble gut are much more durable. One brittle strand in a single gut cast is fatal; but in a treble gut line, if one strand goes wrong the other two may suffice to bear the strain till the fish is in hand.

It is not likely that many people are at the pains nowadays to make up their own casting lines, seeing that they can be bought so easily ready made.

Shop casting lines, however, are sometimes lapped with silk and varnished over the joints. This is an abomination, and ought to be severely discouraged. The varnish cracks off or softens in

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the water, the silk whipping frays out, and, besides, the whole plan is superfluous. Treble gut casts ought to be woven without knots, and single gut is

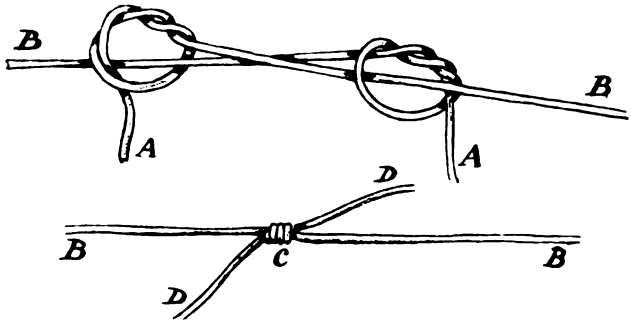

FIG. 12.—SINGLE FISHERMAN'S KNOT.

perfectly secure when tied in a single fisherman's knot (Fig. 12). The double fisherman's knot (Fig. 13), though it looks a complicated affair on

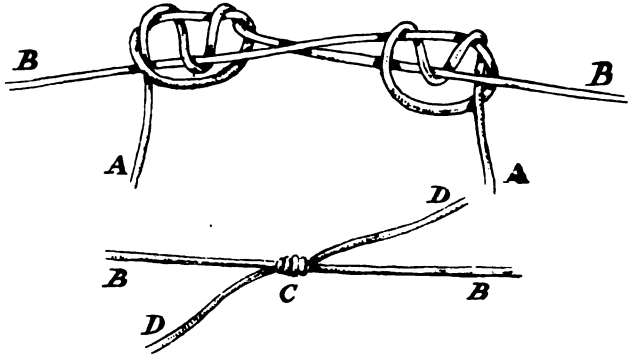

FIG. 13.—DOUBLE FISHERMAN'S KNOT.

paper, is really a very simple one to tie, and is even firmer than the other, though not quite so neat when drawn tight. Some fishermen recommend a

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few turns of fine gut tightly wrapped to act as a cushion between the two sides of the knot when drawn together, but this seems hardly worth the extra trouble.

Although relying on the tacklemaker to supply his casting lines, the fisherman ought to practise the knots in Figs. 12 and 13 for the repair of fractures. The ends of the gut should be well soaked before knotting, or they will be apt to snap, split, or nick. At all times when not in use or about to be used, gut lines should be kept in air-tight tin boxes. Nothing destroys the texture and saps the soundness of gut so surely as sunlight; whence it will be seen that to wind a cast round the hat is one of the surest ways to court misfortune.

An excellent plan for carrying casting lines ready for immediate use is to fold a piece of spongeopiline in two and cut it to fit the inside of a large india-rubber tobacco pouch. Wet the spongeo and place your casting lines in it when you start a-fishing; they will be ready, nicely pliable from the damp, when you get to the water side. But do not forget to take them out of the pouch in the evening. If you are indifferent as to how many tin boxes you carry in your bag, you can purchase a round "damper" box, fitted with spongeo, at your tacklemaker's. Personally I dislike carrying more tins than necessary—one for reserve casting lines and one or two for flies is plenty; more are a nuisance, and the tobacco pouch does not make a noise in the bag.

At the end of the casting line, next the fly, usually comes a single length of treble or single gut called the collar, although in fishing with large flies this is often dispensed with. There are many

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knots recommended for fastening this to the gut loop or metal eye at the head of the fly. It is claimed for the figure of eight knot, such as dry-fly fishers do mostly use, that it is the safest and best; but salmon-fishing often has to be conducted in very bitter weather, and I confess that after trying one after another of the scientific fastenings, I have returned to the elementary one made by tying a knot at the end of the collar, passing it through the eye of the fly and hitching it as shown in Fig. 12. This has the advantage of being easily detached, should you wish to change the fly, without taking out a new collar. But so many anglers lay stress on the advantage of a neater and more scientific knot for metal-eyed hooks, that I avail myself of Messrs. Farlow's kind permission to reproduce their cuts showing Major Turle's attachment, which is the one recommended by Mr. Halford for trout-flies (Figs. 14—18).

All your dealings with gut will be vastly facilitated by the use of a stiletto of well-tempered steel and needle point, such as can be had for a few pence in any sewing-machine depôt. This little instrument is worth its weight in fine gold of Ophir; no knot so obstinate, no fly-loop so misshapen, as to resist its persuasive power; often have I offered a silent tribute of gratitude to the old friend who first revealed to me its merits.

Casting lines made of very fine twisted wire gimp have recently been brought out, and, though I have not used them myself, I have seen them used with success in early spring fishing with large flies. They are immensely strong, and, in heavy water, have the advantage of sinking much deeper than gut.

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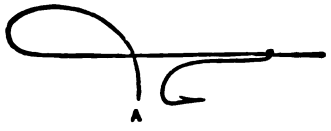

FIG. 14.

Pass the end of the gut (A), previously well soaked, upwards through the eye, and draw the fly well up the gut, so as to be out of the way. Carry the end of the gut round itself to form an open loop as shown above.

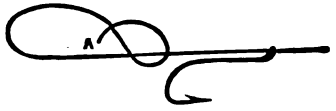

FIG. 15.

With the end (A) make an open turn round the gut and end of the loop, as above

FIG. 16.

Pass the end (A) through the open turn just made, as above.

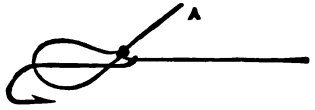

FIG. 17.

Draw the knot thus made nearly tight; if drawn quite tight it is apt to fray the gut in the subsequent operations. Pass the fly through the loop, and place the knot on top of the neck of the eye, as above.

FIG. 18.

Bend the loop downwards, at the same time carefully drawing the fibres of the hackle clear of it, and, holding the fly between the thumb and forefinger of the left hand, draw the loop up close with the upper part of the gut. Pull the knot quite tight with the end, as above.

Cut off the projecting end (A), and the fly is securely fastened.

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Hooks

If some of the anxious care bestowed by salmon-fishers on the choice of flies were bestowed on the quality of the hooks on which these flies are tied, there would be less rending of garments and gnashing of teeth, and fewer deplorable ejaculations uttered than is the case now. The only way to avoid over-tempered hooks that snap, and under-tempered ones that bend, is resolutely to reject all but those supplied by the best makers. Of all the various shapes made, four only are worthy of the attention of salmon-anglers—namely—

The Limerick (Fig. 21).

The Round Bend (Fig. 22).

The Sproat (Fig. 23).

And the Pennell (Fig. 25).

The Sneck (Fig. 19) and Kirby (Fig. 20) bends, though admirable, perhaps the best, for small-sized

FIG. 19.—THE SNECK BEND.

FIG. 20.—THE KIRBY BEND.

trout-hooks, are not to be relied on for salmon. The lateral twist in the bend, which makes them good for trout-fishing, owing to the facility which it gives in hooking, is a drawback for heavy work.

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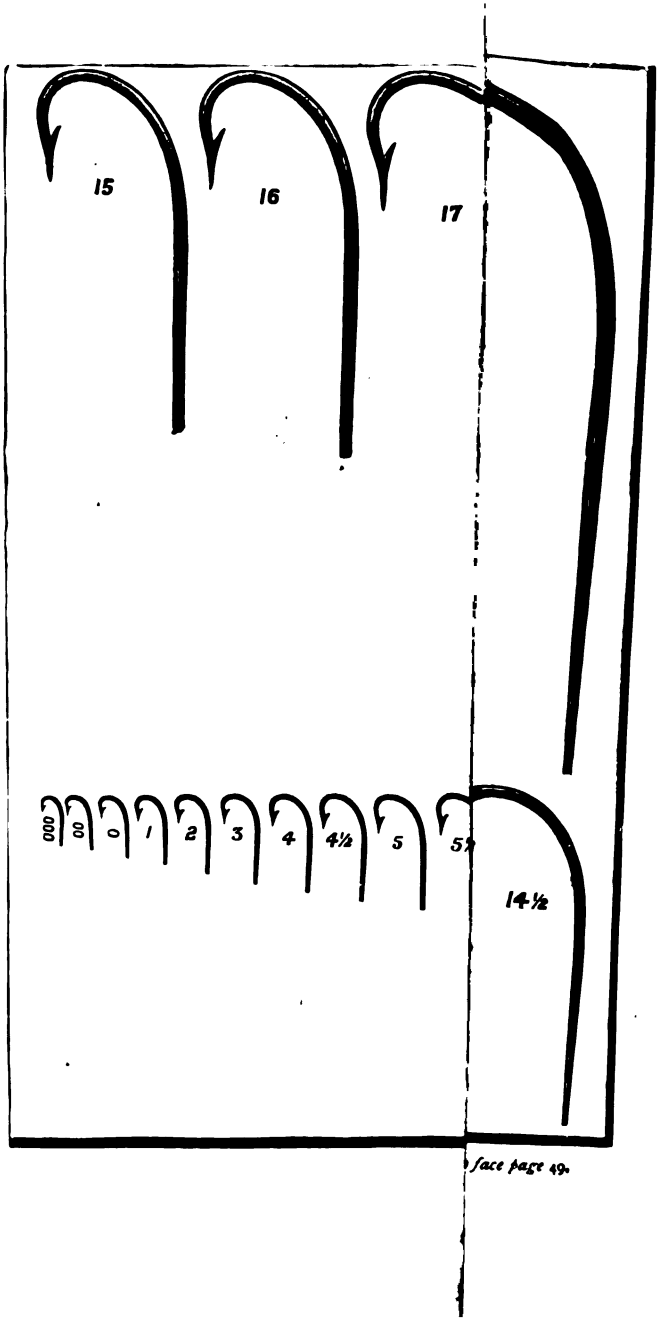

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The metal is apt to give way under a heavy strain not parallel with the shank.

The Limerick bend (Fig. 21) has occupied the place of prime favourite for many years, and deservedly so, provided the distorted version of it which is sometimes seen be avoided—a hog-backed, short-shanked affair with an exaggerated barb and point ranked outwards beyond the line of pull. In the true Limerick the barb is a delicate thing, not too heavy to prevent its being easily buried in the integument of a fish's mouth, but quite enough to make it difficult to dislodge. The point of the hook is slightly turned outwards, to ensure catching hold, but not so much as to cause the pull to come against the inside of the hook instead of fair on the point.

When it is necessary to use very large flies—larger than No. 18 in Fig. 21—these should be tied on long-shanked hooks, such as are commonly used in spring on the Aberdeenshire Dee; and this, not only because of the saving in weight, but because when the bend and barb of the hook is enlarged beyond a certain degree, the chances of its finding secure lodgment in the comparatively small mouth of a salmon are diminished.

The Round bend (Fig. 22) has gone out of favour

FIG. 22.—THE ROUND BEND.

of late years and is seldom met with now, but it is an excellent and strong hook, infinitely better than

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the distorted Limericks one sometimes sees. The trade scale is the same for Round bend hooks (and all others) as for Limericks, except that the Round bend scale contains two sizes—0 and 00—smaller than those of the other bends, and the Kirby bend is not made larger than No. 16 of the Limerick.

A great deal of confusion has been caused by the practice of angling writers to give their own scales of hooks, made out on a different principle to that of the trade. Francis Francis, for instance, in his delightfully gossipy *Book on Angling* gives a plate of twelve Limericks, ranging from No. 1, corresponding to No. 19 in the old trade scale, to No. 12, corresponding with No. 6. Needless to show how necessary to convenience is uniformity in this matter. Messrs. Hutchinson of Kendal, whose metals I have always found trustworthy and of the truest temper, have endeavoured to supply this want by introducing their "Rational Scale," represented in Fig. 21, in which each hook rises a fraction of an inch in length from crown of bend to end of shank. If this scale were adopted as the universal one, then each customer would be able to order exactly the size of hook desired from any maker. But perhaps it is too much to expect that the convenience of the public will override all other considerations with those makers who have adopted other scales.

The Sproat bend (Fig. 23), a modification of the Limerick with a light barb, and no ranking out of the point, was the subject of a good deal of controversy some thirty years ago. It was claimed for it that the strain on the wire just behind the barb (the usual place for a fracture) was not so severe, inasmuch as the pull lay in the direction of the point,

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instead of the inner surface of it, as in the ordinary Limerick. The popularity earned by double hooks perhaps has deprived the Sproat bend of the

FIG. 23.—THE SPROAT BEND.

degree of favour it certainly deserved. But that it is at least equal in merit to the Limerick bend may be fairly inferred from the results obtained by me during ten days' fishing in the North Tyne, during which three different modifications of the Limerick were used as single hooks, namely, (1) the Limerick or quasi-Limerick commonly used in Scotland, heavy in the wire and large in the barb; (2) the lighter Limerick with smaller barb made by Messrs. Hutchinson, of Kendal, and (3) the Sproat. An accurate record was kept at the time, K standing for a fish killed, R for a fish raised, missed or pricked, H for hooked and lost.

No. 1. *Scottish Limerick.*—K, R, K, R, K, K, H, H, R, R, R, H, K, R, R, K, R, R, H (line broke), R, H (hook broke).

No. 2. *Hutchinson's Limerick.*—K, R, R, R, R, R, K, K, H, R, R, R, K, H, R, R, R, R, H, H, R, K, K, K, K, K, K, H, H, R, R, R, R, K, H (hook broke), K, K, R, K, K, R, K.

No. 3. *Sproat.*—K, K, K, K, K, R, K, R, R, K (foul hooked), H (hook broke), R, K, H, K, H, K, R.

Analysis of these hieroglyphics yields the following result:—

No. 1. *Scottish Limerick.*—Out of twenty fish

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that rose (or were known to rise), six were killed, five were lost (including one fracture of the line and one of the hook), and nine were missed.

No. 2. *Hutchinson's Limerick.*—Out of forty-two rises, seventeen fish were killed, seven were hooked and lost (one hook broken), and five were missed.

No. 3. *Sproat.*—Out of eighteen rises, ten fish were killed, three were hooked and lost (one broken hook) and five were missed.

Of this trial the Sproat certainly came out best, being the only one of the three patterns which landed over 50 per cent. of the rises. The hooks ranged in size from No. 16 down to No. 9, according to the state of water and sky; but it would be a mistake to attach too much importance to the experiment. Salmon rise with varying degrees of energy on different days; many rises—how many none can tell—are imperceptible to the angler, and the only conclusion it would be fair to draw is that the Sproat is as good, or perhaps better, than other modifications of the Limerick hook. I would rather take my chance with a badly *shaped* hook, when fish were rising well, than with a well shaped one when they were rising badly; but rather than use badly *tempered* hooks, I had rather not fish at all. Human nature is not so constituted as to endure the vexation arising from that cause.

Messrs. Hardy, of Alnwick, have patented the double-barbed hooks represented in Fig. 24. Of their merits I cannot yet speak from experience, but they look like business. The advantages claimed for them are quicker penetration, and the absence of the deep cut in the wire, necessary to create the barb.

Double hooks have come into very general use

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of late years for medium-sized and small flies, and although some good fishermen have a prejudice against them, it is difficult to understand how any practical man can fail to recognise their superiority

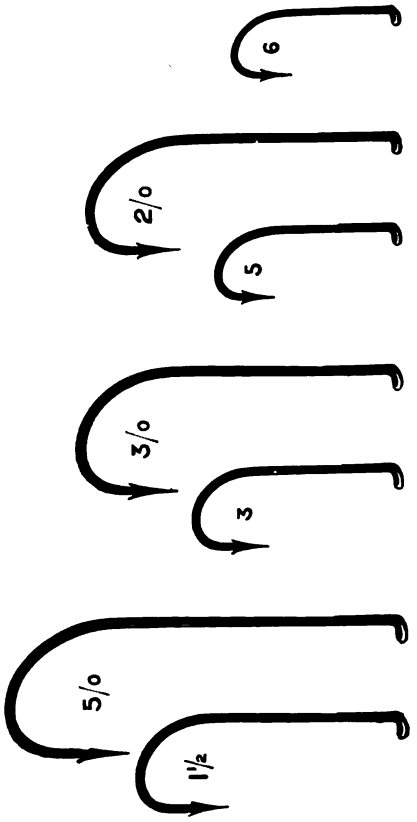

FIG. 24.—HARDY'S DOUBLE BARBED HOOKS.

over single ones. For my own part, I never, if I can help it, use a single hook of less size than No. 16; double hooks swim more steadily in strong water, and, when a fish is hooked, impart a delightful

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degree of confidence in the prospect of landing him. Those who have experience of the merits of Mr. Cholmondeley Pennell's bend in double hooks are not likely to desert them for any other, but as tacklemakers do not usually keep them in stock, it is well, in ordering flies to be tied on them, to do so some time in advance.[1] Mr. Pennell's bend

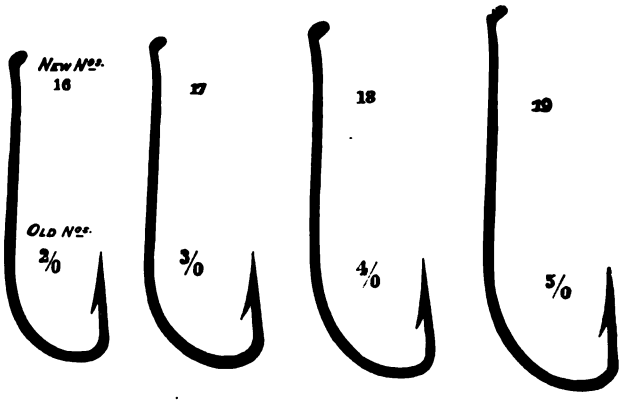

Fig. 25.—The Pennell Bend.

is represented in Fig. 25, showing the new "rational" scale compared with the old trade numbers.

For short-rising fish, or, as he not inaptly terms them, *Salmo irritans*, "John Bickerdyke," the accomplished author of *Days in Thule*, has devised a peculiar form of double hook, with a shank nearly twice the length of an ordinary one (Fig. 26). I

[1] Lately I asked Mr. R. Anderson, of Prince's Street, Edinburgh (whose flies are in the first rank of artistic merit), whether there was any demand for Pennell hooks. He replied that there was very little, though he always kept them in stock, and that many anglers objected to them. I cannot believe the objection to be a practical one.

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cannot speak from experience of its merits; indeed, I have a suspicion that short-rising depends not on judging the distance, but on the method of taking the fly. Some years ago a gentleman wrote to the *Field* describing some observations he had carried out on some gold fish in an aquarium. I cannot give the reference, but the gist of what he had to tell was this. He noticed that on certain days the fish greedily took food offered to them, opening their gills and allowing a strong current to pass through, which bore the food deep into their gullets. On other days, for no intelligible cause, they opened their mouths, but not their gills. The food was taken into the mouth, but in the act of closing the mouth again, the water, which could not escape through the gills, was forced out of it again, and with it the object that had been admitted. It seems not unlikely that something of this kind happens on those days, so well-known both to the trout- and salmon-fisher, when fish rise, but cannot be hooked.

FIG. 26.—THE "BICKERDYKE" DOUBLE-HOOK SALMON FLY.

Of the flies to be tried on whatsoever hooks are selected, it becomes one to speak with the reverence due to a great cult. They are so numerous and various that their description must be given a chapter to itself.

When a river abounds in gravelly or sandy shoals and the general character of its banks is shelving, it is a comparatively simple matter to steer the fish when tired out to a place where either the

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angler or his attendant can "tail" it, that is land it by seizing it firmly by the small of the tail, an operation to which a glove on the hand contributes greater security. I have known a salmon of 42 lbs. landed from the Tweed in this way by a fisherman without any assistance. Most men, however, prefer to get a fish out as soon as possible after it is hooked. The period of playing a salmon is too full of suspense to be willingly prolonged. It is bitter enough when the fly comes away after a brief period of connection: but when a spirited and prolonged contest ends in parting, the terrestrial combatant feels as if his backbone had been suddenly liquified, and is not always able to restrain expressions which, in more equable moments, he must deplore.

The gaff, landing-net, and landing-snare

It is a sound rule, therefore, never to go salmon-fishing without a gaff. No longer ago than 1896 I received a lesson which certainly ought to have been superfluous. I was staying in a friend's house in Scotland where there flows through the garden a swift tributary of a salmon river. In this stream, though a favourite one for sea-trout, few salmon have ever been taken with the rod; most of them keep to the main river. However, on this occasion it was running in tip-top order, and the main river was in flood. Three young ladies having expressed a wish at luncheon to see a salmon killed, I proposed to gratify them. It was a hundred to one chance against my vaunt being fulfilled; nevertheless, there was a lovely little pool under the garden wall, and out we sallied to try it. So little did I expect anything that I omitted to take a gaff. Nor was that all; this pool having one desirable side

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with sloping banks of gravel, as well as an undesirable one with precipitous rocks overhung with rhododendron bushes, I was fool enough to fish it from the undesirable side in order to avoid the trouble of going a short distance round by the bridge. Never did carelessness meet more speedily with retribution. Standing on the garden path, I switched out some line and flung a small Poynder across the swirling water. At the second cast a nice little fish of 8 or 9 lbs. popped up and fastened himself. The ladies were delighted; not so the angler, for it was apparent at once that he was in a difficulty. Trees above and below prevented my ascending or descending the stream. I could only hold on to the fish and tire him out where I stood at the end of a long line. Having done so, I managed to scramble down the rocks to the water edge, but the stream ran deep and swift on the near side; and though I could bring the fish so near that a dozen times had I carried a gaff it would have been a simple matter to slip it into him, each time he was swept away and the operation had to be repeated. At last he lay quiet in a little recess in the rocks; my hand was actually on him, when there came a twitch, the rod straightened, the line flew up into the branches above, and the nice little fish was seen no more.

Now here is the handy appliance which could have saved this mortification (Fig. 27); a gaff which I have never seen equalled for a solitary fisherman; it hangs in its sheath till wanted, and then drawing it out with the right hand, a smart jerk straightens it, the joint, made like the clasp of a pocket-knife, snaps, and you have a thoroughly effective little weapon. It ought to be nickel-plated

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to avoid rust. This gaff was made for me by worthy Mrs. Hogg, of Edinburgh, many years ago. She has long been dead, but she did many a good turn to anglers before she departed.

The length of this gaff when extended is not more than 3 feet. When an attendant is employed he ought to carry one on a shaft of nearly

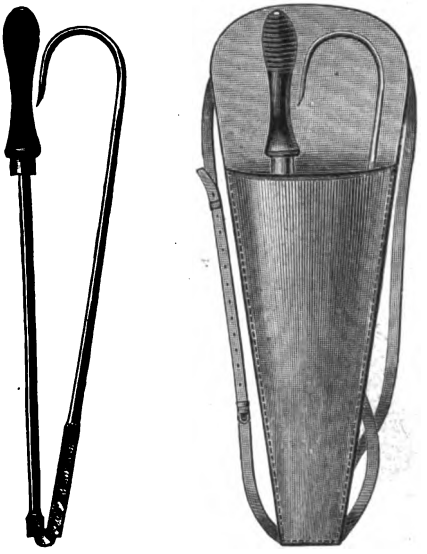

FIG. 27.—THE "MAXWELL" GAFF.

double that length, made of male bamboo, with a screw cap and chain to protect the point.

The proper way to gaff a fish is to wait till he is lying perfectly still; pass the steel *over* the thickest part of his back, and strike smartly but steadily home. The only occasion on which the gaff may be placed *under* the fish with safety is when it is necessary to take him out of deep

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water from a boat, as in a lake or on the Shannon.

The use of the gaff is prohibited in the Tweed and its tributaries after the close of the open season for nets, and it becomes necessary to use a landing-net, such as no one would dream of carrying about with him, and it is usual for one to be kept in every boat on the river. It is the boatman's duty to see that the cord of the netting is sound and strong; like other duties, this is sometimes neglected, and I have known a fish to fall through a rotten net and so escape. At best a landing-net, on the scale necessary for heavy salmon, is a heavy and cumbrous concern, and requires more skill to use it effectively than a gaff. An inexpert hand will bring it up behind a fish and try and get him into it tail first. Nothing could be more futile. The only right way is to get the net under the fore part of the fish, and then raise it so that the head and shoulders fall in first. Even that fails sometimes, as is shown by the following anecdote, concerning what was perhaps the biggest salmon ever hooked in the Tweed. I have told the story already elsewhere, but it is of the kind that bears repetition. Towards dusk on the last day but one of the season 187—, Colonel Haig was fishing the well-known Cradle cast in his own water at Bemersyde when he hooked a fish. Not having seen it, the Colonel, though he felt he had hold of something heavy, did not suspect that the fish was of any extraordinary size. The fish fought away steadily down stream, until at length, at the bottom of the cast, it dashed through the thin water into the Woodside cast, and the Colonel had

The landing-net

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to leave the boat and run down after him along the right bank. The river is very wide at this place, with the deep water on the far side. The fish continued to descend the stream with a great length of line out, and by and by passed clean through the Woodside and out upon the Monk's Ford, nearly half a mile below where he was first hooked. It was very dark by this time; the fish showed signs of exhaustion, and the Colonel sent his attendant into the water to net him. After three attempts the lad called out: "He's that big, I canna get him into the net." A fourth and fatal attempt followed; the iron of the net struck the line and broke it, and the fish sailed slowly away. Even then Colonel Haig did not realise the magnitude of his loss, which might never have been known but for the fact that a couple of poachers had witnessed the closing scene from a neighbouring wood. They marked the wave of the departing fish, and managed to secure him in their net during the night with the fly still in his mouth. It was ascertained some weeks afterwards that this great fish, being too large to go into the poachers' "poke," was cut in half; one portion was sent off from St. Boswell's station, and was certified by the porter who weighed it to have been no less than 35 lbs! Even if this were the better half, it is probable that this salmon was upwards of 60 lbs. in weight, and, had the use of a gaff been permitted, would have broke the record of Tweed captures, instead of breaking only the Colonel's line.

The landing-snare is a substitute for gaff or landing-net, preferred before either by some experienced in Norway fishing, and said to be very

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effective in landing big fish (Fig. 28). I can speak of its merits only from hearsay, but I cannot doubt them, seeing that Captain Pretyman, M.P., tells me that he landed five fish consecutively, averaging 30 lbs. each, by the aid of this snare in his river in Norway. If the water runs deep along the bank, the use of the snare is very simple. It is passed from behind, over the tail of the fish, and drawn tight. In shallow water, however, it is a far less handy implement than the gaff.

The landing-snare

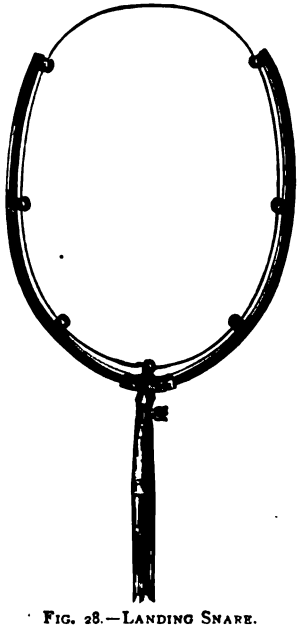

FIG. 28.—LANDING SNARE.

The increasing use of double-hooked flies has rendered some kind of box necessary to carry them, and the field remains open for some ingenious person to immortalise himself by inventing a thoroughly satisfactory one. This much, however, has been accomplished. The old-fashioned fly book has fallen into irredeemable discredit. And not a moment too soon. It is an abomination, even for single-hooked flies, destroying the cylindrical set of bodies and hackles, squeezing works of art out of all decent shape, admitting the air freely to tarnish tinsel, and moths to devour fur and feather. So let the fly book

Fly and gut boxes

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depart into outer darkness, *anathema maranatha!* it has not a single virtue that we should regret it saving the quality of portability, which it shares with many other objectionable articles.

Salmon flies should be carried in air-tight tin cases. Very sumptuous magazines are fitted up by tacklemakers for containing the stock, and some such receptacle will be found very useful, whence each day's supply may be drawn. Here (Fig. 29) is one in polished oak furnished by

FIG. 29.—OAK FLY CABINET.

Messrs. Farlow. As for a portable fly box, for use at the river side, there is none that I have seen or used which does not reveal some unsatisfactory quality. Perhaps the best up to date is Mr. Malloch's (of Perth) patent, shown in Fig. 30. They are made without the compartment for casting lines, which ought to be carried in a separate tin. They carry double-hooked flies by receiving one of the hooks into a metal spring clasp, and the only complaint I have to make against them is

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that these clasps have a troublesome tendency to bend, after which they are useless. Perhaps

FIG. 30.—MALLOCH'S PATENT FLY BOX.

this could be remedied if more care were devoted to the temper of the metal.

Colonel Birch Reynardson lately showed me a box of his own design, which seems to be an advance on any hitherto produced. Shaped like the box in Fig. 29, each leaf is lined with rectangular slips of cork laid close together. One hook of the pair is inserted between the slips, the other

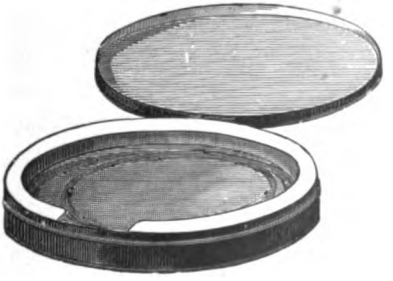

FIG. 31.—RHOADES' "SAFETY" CAST BOX.

lies on the surface. It is to be feared, however, that the edges of the cork would wear away and chip with use.

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For carrying gut casts and collars, the box shown in Fig. 31 is by far the best, and leaves nothing to be desired.

Weighing machines

Everybody who fishes much for salmon ought to carry his own spring weighing machine, on the accuracy of which he can rely. I had landed one afternoon a good fish in the Willowbush cast, at Mertoun on the Tweed, which the boatman's steelyard registered at a few ounces over 30 lbs. Returning home and making the announcement with justifiable complacency, it was exceedingly mortifying to be told shortly afterwards that my fish, having been tested on a scale of unimpeachable integrity, weighed no more than 29 lbs. Every fisherman will admit that there is far more than a paltry sixteen ounces between the two weights.

Spring weighing machines used to be easily obtained made of nickel, and these are much the best, as they do not rust; but it seems that the bicycle trade has drawn away all the workers in that metal, and it is difficult to get the machines except in brass. A delicate instrument of this nature ought to be kept in a leathern case of its own.

The "Priest"

It may seem superfluous to mention this little accessory to the angler's outfit, but on some rivers —the Thurso, to wit—it is exceedingly difficult to find a suitable stick or stone with which to administer the merciful *coup de grâce*, and much trouble is saved by carrying a handy implement, which may be attached by a loop of cord to the bag or basket, or when thigh waders are used, hang to the suspender and lie inside the waterproof The Priest, then, is a short bludgeon

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of 9 or 10 inches long, so named in Ireland because it performs the last office to the fish. It is made of box or other hard wood, with a cavity in the head, widening inwards from the orifice so as to retain molten lead run in. It should be noted, however, that the largest salmon may be easily and immediately killed by thrusting the blade of a knife into the spine just behind the skull.

FIG. 32.—"PRIEST," FOR KILLING FISH.

The fishing bag

A variety of ingenious and convenient forms of the shoulder bag have been devised for the use of anglers, but to carry the salmon-fisher's tackle and luncheon nothing is better than the ordinary game bag of brown canvas. Those made of finer material or of waterproof soon get worn into holes by the corners of tin tackle boxes, reel handles, &c., and the game bag is roomy enough to contain a waterproof and all the other requirements of a day's fishing. For carrying the fish which may be caught, a common bast, such as workmen use for their tools, and costing a few pence, answers admirably. The "Usk" salmon basket, supplied by Messrs. Farlow, is made of

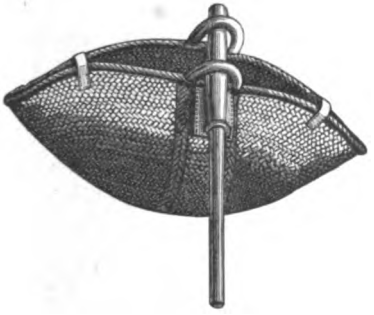

FIG. 33.—"USK" SALMON BASKET.

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superior material, with a staff and pad for carrying over the gillie's shoulder.

Good knives for fishermen are protean in variety; I shall only mention one—the "Novelty" knife, sold by Mr. Pigall, of Rupert Street, Leicester Square. Its peculiar merit consists in requiring only one hand to open it; by pressing the thumb on the rachet at the socket, held downwards, the blade falls out, and is returned by reversing the process. I have found the advantage of this simple invention, especially when fishing in cold spring weather, when it is disagreeable to have to take off a glove.

Fishermen's knives

FIG. 34.—PIGALL'S "NOVELTY" KNIFE.

The last part of the equipment requiring special mention is the waterproof waders, which are manufactured now of wonderful lightness and durability. They divide themselves into two main kinds, viz: wading trousers, reaching above the waist and supported by suspenders over the shoulders; and thigh waders, attached by a side strap to the waistband of the trousers.

Waders

The worst of wading trousers is that they only come into use in certain parts of a river, perhaps only in one cast on a whole beat, and for the rest of the day prove unpleasantly hot and heavy. Nevertheless, sometimes, and on certain waters, they are indispensable, and no sportsman should sanction the use of a boat on a cast that

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may be commanded by wading. Two pairs of woollen socks, not too thick, should be worn under the waterproof, and one pair of coarser material between it and a pair of canvas brogues with leather soles, heavily nailed. The object of having *two pairs* of socks under the waders may be seen on taking them off after a day's fishing. The inner pair will be found perfectly dry, while the outer pair are quite wet from the wearer's perspiration becoming condensed against the waterproof.

When it is not necessary to wade more than to mid-thigh, either wading stockings may be used with socks and brogues over them as recommended for wading trousers, or a combination of the wading stocking and brogue made in one piece. This kind of waders is exceedingly comfortable, but they are rather troublesome to keep in order. The wading trousers and stockings may easily be turned inside out to dry, and this ought to be done each time they are taken off. But the combination wader cannot be so treated; they can only be turned back as far as possible, so as to allow the moisture inside to evaporate slowly, and, before laying them by for a prolonged rest, heated oats may be poured in to dry them thoroughly. The leathern feet should be regularly rubbed with soft soap to keep them pliant, and the wicker "trees" supplied by Messrs. Cording, of Piccadilly, are invaluable for keeping the ankle parts of a proper cylindrical shape. Carefully treated in this way such waders will last for a long time; small rents or abrasures are easily repaired with material provided for the purpose by the makers.

Good wading equipment properly put on as

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described above is a thorough protection against cold. People may often be heard commiserating the fisher in early spring, standing up to his waist in water hardly above the freezing point; but their sympathy is thrown away. Often in January and February I have waded all day in snow-fed rivers, sometimes with the line freezing in the rings, and have been obliged to suck the ice off the fly, which has become like a huge lollipop; but with plenty of Shetland wool above, a cap with flaps to pull over the ears, woollen gloves, and well-packed waders below, there is not the slightest difficulty in keeping up the circulation.

When the legs are protected by waders there is no object in carrying a long waterproof coat; but beware of one too short! Even if you try on a coat when you are buying your waders, remember that the latter when wetted do not come quite so high on the thigh as when new and dry. The skirt of the coat should overlap the tops of the waders by at least four or five inches, otherwise you will find yourself in the miserable plight I was in one day in the spring of 1897. I had lost my good old fishing macintosh, and bought a new one, which came into use one day of heavy rain. I cared nothing how it poured: was I not clad in waterproof from neck to toe? Presently a chill trickle ran down the front of my right thigh; then another descended along my left thigh. The wretched coat was just long enough to meet the tops of the waders, and was treating them as the roof of a house treats the water-butt.

About flasks and their contents every angler will have his own notions, and the only observation I

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shall venture to make about them is of a somewhat negative character. In wintry, violent weather the flask is rather a snare. A heavy blizzard, such as often careers over the wastes of Caithness before a tearing nor'easter, has a strangely bewildering effect. At such times raw whisky passes over the palate like water. Beware of it! The slightest drowsiness may end in a sleep from which there is no waking.

The flask

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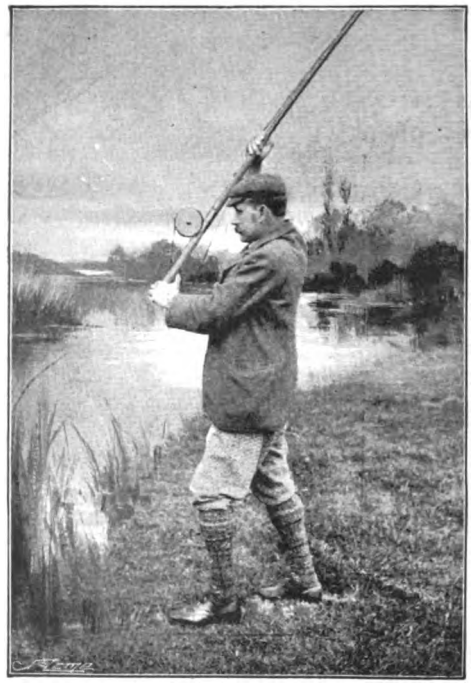

MR. HARDY, OF ALNWICK MAKING OVERHAND CAST.

CHAPTER III

THE ART OF SALMON-FISHING

Casting the fly

THE attempts made to impart by written directions the art of casting the fly have been equally numerous, bewildering, and futile; nor is it on record that any beginner has ever derived the slightest assistance from them. Take the Spey cast, for instance—that knack by which a long line is drawn from the water in bewildering curves till the fly rests for a moment on the stream close in front of the angler, apparently utterly out of

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his control, when a smart downward cut of the rod sends it whirling 30 yards across the current—who can describe the exact adjustment of poise and force essential to the execution of this most intricate manœuvre? Not I, forsooth, for I am no master of the Spey cast. When there is a cliff or high bank behind me, when the stream runs at a kindly angle and the wind is not too unfriendly, above all, when there is no professional critic looking on, I am able to project the line somehow in fair fashion towards the desired place. But as for trying to explain how this is done—perish the thought! I have too much self-respect to concoct a paraphrase of the elaborate instructions given by earlier writers; and as for the unhappy man who should try to carry *my* directions into execution—that way lies madness!

No; Izaak Walton showed commendable discretion in refraining from difficult description, remarking of certain things that they were "to be observed better by seeing one of them than by a large demonstration of words." Even the more didactic Franck, Walton's rival and implacable critic, contented himself with generalities, and almost the only direction he gave for casting the fly was that the angler should keep the wind at his back. There is, indeed, but one plain course to be taken by him who would learn either the Spey cast, or the figure-of-eight switch, or the over-head cast, or the under-handed cast—let him put himself humbly in the hands of a good fisherman, who is willing to communicate the beautiful art. It is only in that way that he will learn of how much good greenheart and well-dressed silk line are capable. Like most lessons, the learning

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thereof is inseparable from suffering. You watch your mentor delivering his cast; the long serpentine curve straightens over the water; a little tilt of the butt, and the casting line, though the lightest part of the projectile, falls not first, but furthest; nothing can be more graceful and, at the same time, appear so easy. You take the rod and try to do the same. Your preceptor's movements were noiseless—how is it that when you imitate them the rod makes a loud "swoosh" through the air? How is it that instead of flying out far and fair the line either falls on the water in what a good old gillie of mine used to call a "burble," or, at most, scrambles out in a wriggling, uncertain manner, depositing the fly half-a-dozen yards away from the spot aimed at?

Because, sir, you are casting with the butt instead of with the top joint.

But how am I to help that when it is the butt that I must grasp?

Well, I am sure I can't tell you, and, if I could, it would not be intelligible: it is like learning to ride a bicycle; the neophyte despairs of acquiring the art; but it comes, and in three or four days he is threading his way through crowded streets.

Or it does not come. I am acquainted with the owner of one of the most productive salmon waters in Scotland. I used greatly to marvel why he cared nothing for salmon-fishing, making mental comparison of his neglect of his beautiful stream with my own conduct were I in his place. I have since learnt that he once made a resolute attempt to learn the figure-of-eight switch at the hands of a past master. It was early in the season, when big flies are necessary, and it was blowing the usual

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gale. The lesson proceeded with the customary amount of injunction on the part of the craftsman and of expletive on the part of the novice, till at last, having attained, as he thought, to the exact degree of poise, the latter delivered a vigorous cast, and immediately was conscious of a violent blow and sharp pain in the lobe of his ear. The fly on a 3½-inch hook, driven by the gale, had struck him on the back of his head, and the barb had buried itself in the gristle of his ear. That gentleman discontinued his lessons, has never resumed them, and lets his valuable angling rights.

I shall never forget the rueful countenance of one who, some years ago, rented a salmon-fishing in the south of Scotland, and engaged the friendly offices of a local expert to teach him the trick. One fine morning in April, on my way to a higher beat on the same river, I saw from the road this couple at work on a celebrated cast. I stopped the dogcart and went down to see if they had met with fish. The stranger was sitting on the bank with a most melancholy expression on his features, and beside him lay three lovely spring salmon.

"You have done pretty well!" I observed.

"Oh," said he, "*I* didn't catch 'em; it was Major S——," pointing to his instructor, who, up to his middle in the water, was doing his best to turn the trio into a quartette.

"I am showing Mr. A—— the water," cried Major S—— over his shoulder, with a twinkle in his eye. He had allowed his pupil to try his hand first, and, after he had utterly failed to get the fly into the desired quarter, had gone in himself with the result described.

However, as I have said, the art, though diffi-

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cult, may be acquired by imitation of a good practitioner, and, once it is mastered, constitutes one of those delightful combinations of strength and delicacy in which is found the chief charm of the higher athletics.

Fishing a cast

What has been said above about the art of casting the fly applies equally to the science of fishing a stream or pool in a river. The utmost that can be said of the elaborate diagrams by which some authorities have endeavoured to explain the process is that they are interesting and sometimes useful to the experienced angler. The object being to show the fly in the most attractive way to the fish, that can only be acquired by practice, following on attentive observation of a practised hand. The radical difference in fly-fishing for salmon and trout is this, that whereas the trout fly is often (in dry fly-fishing invariably) cast up stream, in salmon-fishing it is cast down stream.

There is another important difference between them, namely, that although the trout-fisher may go forth alone on any river to which he is a total stranger, and, by his knowledge of the habits of trout, be guided to the likeliest places and fare as well as if he were directed by a local expert, it is not so with the salmon-fisher. The appearance of the surface is a most fallacious indication of the spots where salmon will rise to the fly. In every river there are lots of places which have all the appearance of lovely salmon casts, but which some configuration of the bottom or set of the current causes to be avoided by the fish. Other places, again, where fish lie regularly and may be seen plunging and rolling, and yet never yield one to

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the fly, either because of the depth of the water or from some unknown cause.

On the other hand, there are sure to be places the reverse of alluring to the eye, which nevertheless are among the best casts in the river. Those who are acquainted with that charming little river, the Cree, flowing past Newton Stewart into Wigtown Bay, will remember that long stretch —between two and three miles—of dead, canal-like water known as the Loch of Cree. No doubt salmon harbour in most parts of it, as is proved by their having been taken on the spoon or minnow trailed behind a boat; but there is only one spot in the whole of it, known as Cunninghame's Ford, about 30 yards in length, where it is of the slightest avail to fish with the fly. A stranger can detect no difference in this particular reach to any other in the Loch of Cree, yet it is the most productive cast in the whole river, and, given a nice breeze, it is no unusual feat, even in these years of leanness, to take three, four or five spring salmon out of this small extent of water.

It should be mentioned, by the by, that the name Cunninghame's Ford has been given on the *lucus a non* principle—for ford there is none. It happened many years ago, when farmers (as seems almost incredible now) occasionally took more whisky on market days than they could carry steadily, that the tenant of the farm on the left bank of the river drove up the road from Newton Stewart on the right bank. Arriving opposite his own house, he realised his blunder, and tried to rectify it by making a greater one. He drove his horse into the river and was quietly drowned.

Of course, a man going out on a strange river in

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which there are plenty of fish probably will get hold of something, if he fishes what seem to be the likeliest places; but he is certain to waste a deal of his strength and precious time over water of which he knows neither the depth nor the attraction it has for salmon, while he misses some of the choicest bits where fish may be lying ready to seize the first object that excites their curiosity. In fact, the only thing to do on visiting a river for the first time—aye, and even until after many times, for the haunts of fish vary with the amount of water and season of the year—is to put oneself as humbly into the guidance of a gillie as one does into the hands of a stalker in a deer forest. Nobody will believe, until he has tried it, how helpless a stranger finds himself in fishing an unfamiliar salmon river by the light of nature.

Then, again, there is a great variety in the character of rivers in the following respect. Some change not their channel from generation to generation. The same pools attract fish now as have done so for hundreds of years. But in other rivers it is very different, especially those which run over extensive beds of shingle. These are subject to constant change: some pools fill up, and others form elsewhere; and the angler who has learnt where to look for fish one year may find himself wholly at a loss when he returns after a winter's floods. I confess I am very fond of these changeable rivers. There is a mighty charm in roving down an altered channel, fishing the new and likely places, and a great excitement in hooking a fish where none have been known to be taken before.

In lowland streams, running through arable land, it is usually, one may say invariably, found to be

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useless to fish in a rising water. When the water first begins to rise is, indeed, a deadly time; but after it has risen a couple of inches you may pack up and decamp. That this is the effect, not of the increase in the volume of water, but of the impurity washed into it off the land, seems to be proved by the contrary experience in Highland rivers, especially in those fed by melting snow. Fish are often killed in these during a rapid rise in the water. Last month (February, 1898) my gillie killed a salmon in the Helmsdale after the water, above good fishing size when I began, had risen fully six inches, and I had given up the game.

The mode and rate of working the fly varies considerably in different waters. As a general rule it is more profitable to work it slow than fast; indeed, except where salmon are lying in swift water, not much more than three feet deep, it is hardly possible to move the fly too slow consistently with keeping a taut line. It should be remembered that the salmon lies at the bottom of the water, not midway to the surface, like a trout on the feed; that he is not habitually a surface feeder, and is not likely to move at any object on the surface, unless it excites his attention by dangling and dancing above him. Many a fish that treats with indifference a lure flashing rapidly over his head, may be roused to attack it when it is hung in the current with just enough motion to stimulate life. "Dub-fishing," that is, fishing the "dubs," or still reaches, in the lower part of the Tweed from a boat, is a revelation to many who have been accustomed to narrower, livelier waters. Here the rule is sometimes formulated thus: cast your fly across at right angles to the gentle cur-

Working the fly.

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rent, and bring it round so slowly, with a very gentle undulatory movement, that thirty seconds may elapse between each cast. Thirty seconds, mind!—not while you may count thirty, but while you may count one hundred and twenty as fast as you can. It is surprising what a slow fly this implies, but experience has proved it to be the deadliest method.

It implies more than a slow fly; it means a deep one, especially if you are fishing with a double hook, and most successful fishermen are of one mind about the advantage of a deep fly. I have never encountered but one of these whose practice differed from "the low point and the deep fly." It was in 1867 that I fished for the first time in the North Tyne. It was practically a new river then; Bywell Dam, a formidable obstruction some distance above Hexham, had been swept away five years earlier, and has never been restored. As long as it was there, very few fish ever got past it; but, so soon as it went down, the salmon got a free run to the upper waters, and the North Tyne has been an excellent angling water ever since. Moreover, the produce of the fisheries *below* Bywell has enormously increased.

A deep fly

Well, at Reedsmouth, the junction of the Reed and North Tyne, there lived, in the days I speak of, a certain Dr. Begg, who rented the fishing of a couple of casts on the main river. "Begg" is a name derived from the Gaelic, signifying "little"; and certainly it was appropriate in this case, for the worthy doctor could not have measured more than five feet in his stocking soles. When I first met him, early in October, 1867, he had killed upwards of 150

The "Brownie of the Tyne"

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salmon and grilse with the fly during that season. And such flies! all of nearly the same pattern—fat, fuzzy bodies, generally of gray rabbit or monkey wool, enormously over-winged, on small single hooks—and nearly all of the same size, rather large, and tied on collars of undyed treble gut. He very seldom left his house before midday, when, if the water was in order, he would get into a pair of enormous wading trousers, button his long, yellow "Piccadilly weeper" whiskers into his coat, clap on a cowboy hat, stuck all over with hairy salmon flies, take his spliced rod, of the Castle Connel type, off the rack, and stroll down to the river. Wading in almost to the armpits, he would begin on a fine stream which ran at the foot of his garden, ever since known as the Doctor's stream, flinging his flies (he always used two of these monstrosities at once) across the current at right angles and bringing them round to within a few yards of where he was standing. No low point and deep fly with him! On the contrary, he gradually *raised* the point of his rod after delivering the cast, trailing the flies along the surface of the water, so that when he had finished the circuit his rod was quite erect. Any orthodox salmon-fisher who had seen for the first time Dr. Begg angling, would have set him down as an incompetent bungler. Yet, as I have said, he was remarkably effective.

Kindly, quaint "Brownie of the Tyne," as we used to call him—he has been under the daisies this quarter of a century; yet many a time do I recall his extraordinary appearance—a huge hat, a very red face, and a pair of arms emerging from the expanse of gleaming brown water; and as often do

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I reflect with gratitude on his readiness—so rare among anglers—to let a friend fish the best of the water before him. His prodigious whiskers landed him in a painful dilemma once. He had hooked a strong fish in mid-stream, and was making his way ashore, with rod held aloft to keep it clear of the water. His whiskers had been snugly housed and buttoned down as usual when he started, but a button having given way, one of them had escaped and fluttered in the breeze. It caught in the revolving handle of the reel, for the salmon was running merrily, and was wound up tightly to his cheek. He managed to land his fish, but the whisker had to be shorn off close before he was released.

But this digression goes beyond the license in garrulity claimed by most old fishermen. Dr. Begg was introduced merely as an example of success in defiance of the usual and salutary doctrine of a deep fly.

"Backing it up"

There is one observance which the beginner is not likely to learn from an ordinary instructor, because it forms no part of common practice. Yet "backing it up," as it is called, proves successful in so many cases where a cast has been fished down from top to bottom without result, that it must be regarded as a very useful expedient. It is no more than the application to ordinary streams and pools of the method employed on the Tweed "dubs" and certain other waters of a like sluggish nature, where a beginning is made at the bottom instead of at the top. It is managed in this way. Having fished down to the bottom of a cast, draw out a few yards more of line and throw the fly as far across the current as possible. Then

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retrace your steps *very* slowly, pausing each time the line hangs straight below you to make a fresh cast, and repeat the operation till the top of the pool is reached. Times far beyond reckoning have I found this extra trouble been rewarded by the strong pull and lunge of a good fish, which had failed to move, or, at least, had not been seen to move, when the fly was brought down facing him. There are two reasons which seem to account for this. In the first place, when the current, as usually happens, is swiftest towards the centre, a fly cast beyond it moves more slowly than that part of the line which lies in the stronger water. The result is, a belly in the line, the fly being pulled out of "hang," and drawn in an irregular way across and partly down the stream. But when the angler is moving slowly up stream, this belly is drawn out of the line, and the fly moves in an attractive way. In the second place, it is possible that an object on the surface moving up from behind a fish may excite his curiosity more powerfully than one moving — partly floating — down towards him. Whatever may be the explanation, it is certain that "backing it up" is a very deadly device, often successful when other modes have failed.

Very various and often contradictory are the counsels of salmon-fishers in respect of the amount of play, or secondary movement, which should be given to the fly in drawing it across and through the current. Some vibrate the rod top somewhat rapidly; others oscillate it slowly and gently with an up and down motion; a third school believe in holding the rod quite still and low, allowing the current to

Movement of the fly

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impart a life-like movement to the fly. Perhaps those are the best practitioners who employ all these methods in turn; if one of them does not attract a fish, another one may do so. I am rather prone, after making a cast, to take hold of the line just above the reel, and jerk it pretty smartly and repeatedly. It is a delicious sensation when a fish lays hold and snatches the line out of the fingers; but I have never been able to discern any advantage in one of these methods over another. *Sua cuique voluntas*—every man to his humour. Connected with this question is another upon which opinion is pretty sharply divided, namely—whether a hand or finger should be kept on the reel line while fishing a cast, or whether the line be left free, as in dry fly-fishing, where reliance is placed on the check of the reel to hook the fish. There is this important reason for leaving the line free when dry-fly fishing among large trout, that the gut is so fine and the hook so small as to render exceedingly imminent the chance of fracture, or, at least, of tearing away the hold, if the line is held tightly. There is not the same danger in fishing with large single hooks or smaller double ones on salmon gut, and I have no hesitation in recommending that the index finger should be kept on the line *at all times*, until the fish is firmly hooked. If the gut is sound and the rod has not been allowed to fall too nearly into a straight line with the line, there is not the slightest reason to fear a breakage. One certainly *can* hook a fish from the reel, but the stroke is not nearly so certain, and the angler loses the start in the tug-of-war which is to follow.

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Judging from the common practice of fishermen, it is possible that some anglers of experience, on reading the marginal title of this paragraph, may exclaim—"Hearing! what does the fellow mean? Salmon can't hear!" Can they not? Then why are they provided with a distinct auditory apparatus? I am inclined to think that the hearing of most fish, and of salmon in particular, is much more acute than is usually supposed. My attention was first drawn to this subject many years ago. I was painting on a still autumn day beside Loch Ken, in Galloway. The lake was perfectly calm; round its margin, close to where my easel was planted, the shallow water was full of shoals of very small fry—probably young perch, though of this I cannot speak with confidence. In the afternoon I heard a shot in the distance, and noticed the fry dart away from the shore, to which they drew gradually near again. Presently a party of sportsmen appeared about three-quarters of a mile distant in a turnip field. They fired a few shots at considerable intervals of time, and at each shot the small fry repeated their movements of alarm, approaching the shore after each report. On recounting to sportsmen this experience, I have almost invariably been met by the argument that it was not sound which the fish perceived, but vibration. But can sound be defined as anything else than vibration of the atmosphere? or hearing as anything else than perception of sound? When the vibration of the atmosphere is sufficiently strong to be communicated to the water, undoubtedly all creatures in the water possessing auditory organs can hear it.

The hearing of fish

Again, at Logan, in Wigtownshire, there is a

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peculiar fishpond, used as a stew for sea-fish, and formed by the excavation of the rocks and the admission of the tide through a grated tunnel in the cliff. Many a time have I peeped over the enclosing wall and viewed the deep basin, filled with green water in which not a single fish was visible, or, at most, a pollack whiting or two cruising about near the surface, or a sea-perch poking in the seaweed on the precipitous sides. The door in the enclosure is kept locked; a flight of wooden steps descends from it to a path cut in the live rock round the basin. At the sound of the first footfall on this stair, what a change takes place in the quiet waters! Great cod sail up from the bottom; lythe and saythe dash about looking out eagerly for food, the distribution of which they have learnt to associate with the sound of human footfall. Formerly, a wooden clapper was used as the fishes' dinner-bell, but this has been discontinued as superfluous; the footsteps are sufficient summons to the denizens of the pond. Listen to what Dr. Francis Day has to say about the hearing power of fish:—

"Hearing is developed in fishes, and it is very remarkable how any difference of opinion can exist as to their possessing this sense. . . . The internal auditory apparatus is placed within the cranial cavity; its chief constituent parts are the labyrinth, which is composed of three semicircular canals and a vestibule, which latter expands into one or more sacs, where the earbones or otoliths are lodged. A tympanum and tympanic cavity are absent. They possess fontanelles between the bones, forming the roof of the skull, which, being closed by very thin bone or skin, permit sounds from the surrounding water to be readily transmitted to the contiguous internal ear. But the chief mode in which hearing is carried on must be due to the surface of the fish being affected by vibration of the water, and the sounds are trans-

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mitted directly to the internal ear,[1] or else by means of the air-bladder acting as a sounding board."—(*British and Irish Salmonidæ*, p. 19.)

The connection between the air-bladder and the auditory organs, alluded to by Dr. Day, is confirmed by Dr. Günther.[2] It is established in a remarkable way in some of the *Teleostei* (a subclass to which most fish of the present age belong), and it is illustrated in Dr. Günther's treatise in the diagram of the internal structure of a carp (p. 118). Mr. Abel Chapman makes an interesting suggestion on this subject, which, as I have not sufficient knowledge of anatomy to verify or dispute, I prefer to give in his own words:—

"Just as in the half-light and rifted shade of the forest, the elk has learnt to rely more on the sense of scent and sound than on that of sight, so too does *Salmo salar* in the depth of his swirling pool; and in each case nature, ever prompt to supply an equipoise, comes to aid. The broad, palmated antlers of the elk serve to concentrate the least vibration of sound-waves, and direct them into the cavernous ear behind; while in the salmon [which has neither (external) ears nor sense of smell][3] there is provided an apparatus that intensifies the fish's sensitiveness to every external change.

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[1] Speaking with scientific accuracy, *sounds* canno be transmitted in this way. It is the *vibration* which is transmitted, affecting the auditory nerve, which conveys to the sensorium the impression causing the sensation of sound. Sound is a sensation which cannot be perceived till the auditory nerve is excited by vibration, even as sweetness is a sensation caused by contact between the surface of sugar and the gustatory *papillæ*, whereby the sense of sweetness is excited in the sensorium of the taster.

[2] *An Introduction to the Study of Fishes*, p. 116.

[3] It is certain that salmon, like most fish, *are* capable of perceiving odours, though the sense of smell is not connected with respiration, as in mammals.

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On the top of his skull are placed two oblong, bony plates, perhaps three inches long, one on either side, each covering and, as it were, closing with a valve a small circular aperture in the cranium—say half an inch in diameter—and leading to the brain. Thus there is communicated to the brain, magnified in the ratio of at least six to one, the faintest wave-sound [? sound-wave] or vibration in the waters above. The moral is that the angler may fish without fear down-stream: he need not use that extreme care to conceal himself that is imperative in trout-fishing, but he will do wisely to avoid any unnecessary disturbance of the water."—(*Wild Norway*, p. 54).

It is only in *Branchiostoma*, the lowest order of fishes, that the organ of hearing is absent.

Now whether a salmon, lying in the twilight of a deep and rapid stream, is alarmed by or indifferent to sounds external to the water, is a question which every man must decide according to his discretion. But there seems to be very little doubt that such sounds can be heard by fish in the stream, and it seems imprudent to rely on their neglect of them as warning of the approach of an enemy. Consequently, I object with all the vehemence at my command to any one clattering among the stones on the bank near where I am fishing. Still more objectionable is it when a boatman, standing waist-deep beside the boat while I am fishing a still-flowing reach of the Tweed, noisily empties his pipe by rapping it against the gunwale. Another most obnoxious trick, almost universal, is to throw down the chain into the boat before embarking with a clatter that penetrates into all the recesses of the pool, or to bump the oars loudly against the bottom or sides of the craft. My remonstrance against such proceedings (when I am bold enough to make one) is received with amused surprise; I

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am set down, no doubt, as "fykie," or "prejinketty," which are the Scottish terms denoting a "crank," or there is mentally applied to me some other of those epithets, in which the Scottish tongue abounds, expressive of well-bred contempt. I don't care; I prefer not to throw away a chance. There is a better chance of catching a salmon which has not been made aware that somebody is after him, and he is exceedingly likely to interpret unusual sounds as a hint to be on the *qui vive*.

The most experienced trout-fisher will find himself at a loss for material on which to found a judgment as to the likeliest time of day to find salmon in a taking mood. In trout-fishing the time of "the rise" is generally well marked. It takes place when aquatic larvæ—duns, March browns, spinners, May-flies, or what not—approach the surface in order to become winged insects. The degree in which salmon partake of fresh-water fare will be discussed in a subsequent chapter; but this much may be assumed that, in general, they are indifferent to the insects which form a great part of the food of trout. Nevertheless, every salmon-fisher knows that salmon are subject to periods of activity, more or less marked, in the course of the daylight hours—periods during which the angler who has laboured in vain for half-a-day may move fish after fish in quick succession. Some days there are, distinguished by no outward characteristics from other apparently equally good fishing days, when salmon seem on the alert morning, noon and evening. Such days (alas, how rare they are!) sometimes follow each other in succession. The most rapid and unflagging sport I ever had was in the

The best time of day

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North Tyne in the autumn of 1872. I killed 46 salmon and grilse weighing 561 lbs. in four days and a half. The forty-sixth fish was hooked with the last cast on the fifth day. I had no more than time to land him, and run up to Reedsmouth station to catch the 1 P.M. train. *Papæ!* how often I have groaned over the engagement that took me to Edinburgh when fish were in such a glorious mood! That fifth day was the only one on which I have known salmon to rise well in a thick fog. Generally it may be regarded as the one aspect of meteorology fatal to sport; yet on this occasion between 10 A.M. and 12.30 I landed six salmon weighing 88½ lbs. (largest fish 21 lbs.), and had I been able to finish the day I must have achieved an average for the five days of over ten fish a day. Such chances do not occur often in an angler's life-time.[1]

Such days of steady rising are the exception. Most anglers have come to the conclusion that in salmon-fishing certain hours are more productive than others, though it is not easy to find any two who agree in what these hours are. The fact is that salmon may be, and are, taken at all hours of the day, and the only time when it is impossible to hook one is that time when your fly is not in the water.

[1] The pleasure of fishing is greatly increased by keeping a regular log. Don't make your record on scraps of paper, or in perishable note books: have a substantial, well-arranged tabular ledger, which will show in after years when, where, and how good and ill success befel you. Memory is not only perishable but treacherous. I should not have ventured to relate the experience of these happy days did it not stand in black and white as written down at the time. It is not agreeable to imagine what a blank would be created if my fishing book were lost or destroyed.

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There is, however, one hour in the day when salmon are wont to come astir more often and more regularly than any other—to wit, the hour that includes sunset. It does not seem that this has any connection with the heat of the sun, for it is as well marked in February and March—it may be in snow and frost—as in midsummer. Winter daylight is very brief in penultima Thule, and the sun has very little power, yet even there the gloaming retains its virtue. On January 31st, 1896, I fished the Linns below Loch More on the Thurso, and killed a fish of 18 lbs. immediately after beginning about 10 A.M. Not another fin did I stir all day, except a kelt or two, till about four o'clock, when it was getting dusk. I was then fishing the Hay pool for the third or fourth time, and I hooked and landed a fine fellow of 18½ lbs. It was nearly dark when I got him out. Numberless instances of similar experience must occur to many fishers. The most that can be said about the best time of day is this—if you are restricted to part of a day, let that part include the gloaming, provided that the water is not to be fished meanwhile. In order to allay your impatience to be at work you may call to mind the judicious sentiment of the oft-quoted Richard Franck, "lest precipitancy spoil my sport, I'll preponder my rudiments." But if the choice lies between "first fly over" and the evening fishing after other people—do not hesitate; take the morning and the advantage of fishing it before any one else.

The Magic Hour.

It is undoubtedly a great advantage to be the first on the water, yet salmon are so capricious, and the influences which affect them so imperfectly understood, that the last comer sometimes finds

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sport where others have failed. This is the case even in small rivers, which, of course, are more easily disturbed than large ones. I was fishing the Luce on the last day of the season of 1870. It is a very small river, subject to violent floods, after which it subsides very rapidly. On this occasion it was much below fishing size, the sun was bright and the air frosty. Had it not been the last day of the season, there would have been little to tempt one to the water side. I had tried some of the most likely places without avail, and wended my way with slender hopes to a pool where a high cliff partially screens the water from the westering sun. Slender as they were already, my hopes evaporated altogether when, on approaching the pool, I saw the sunlight flashing on the line of some one who had anticipated me. It was a local angler, a farmer, whose personal name I forget, but who was always known—*more Scotico*—by the name of his farm, Back-o'-the-wa'. Now Back-o'-the-wa' knew every inch of that water, and small blame to him, for, by the same token, he lived on the banks of it, and was no mean performer with his stout old hickory and lancewood. Thinks I to myself, it isn't much use putting a fly over this in the present low state of the water after Back-o'-the-wa' has raked it. However, the Red Brae was a favourite cast of mine;[1] it was the place I had killed the first salmon in my life, and it was the last chance I had for the season; so as soon as Back-o'-the-wa' took his line off at the foot of the

[1] The Luce is one of those rivers above alluded to which constantly change their channel. There is no pool at the Red Brae now, and a new one has formed itself a hundred yards lower down the river.

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pool, I laid mine on at the neck. There was a sharp stream running in at the top, spreading into nice dark ripples under the cliff on the far side. I had not travelled far down it before there came a flash and a snatch, and I was fast in a strong fish. Marry! but he flew about the pool, never still an instant, and I felt quite powerless to control him. By luck he dashed into some shallow water on the near side, where he was almost stranded on the gravel, and my attendant slipped the gaff neatly into him, before he had been in play for five minutes. It was a beautiful clear fish, such as sometimes may be got near the sea even late in season, weighing 22 lbs, and hooked *by the anal fin*. It is difficult to think he had not seen Back-o'-the-wa's fly; and apparently when mine came over him he lost his temper and tried to strike it a blow with his broad tail.

Let me relate a converse experience in the same river within half a mile of the same spot. Less than a week before these lines are being penned, on August 14th, 1897, there was a good spate in the Luce, and I was invited to try my luck with the sea-trout. Just as I was hesitating in the morning whether to put up a big rod or a little one, a clean grilse of about 7 lbs. threw himself out of the foam-flecked water, and decided me in favour of the heavier weapon. As matters turned out I was wrong, for I never stirred a salmon or grilse all day, though several were showing themselves. I got a pretty score of trout weighing 25 lbs., but sea-trout cannot display their sporting qualities on a big rod and heavy tackle. Well, about 3 P.M. a farmer friend appeared, who had been fishing higher up. I invited him to try a pool, Linblane, by name,

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which I had fished earlier in the day. At his very first cast, up came a grilse, fastened bravely, and in five minutes was hanging on the scale with the index at 5 lbs.

"Shall I try for his neighbour (good Scots for 'comrade')?" he asked.

"Certainly," quoth I; "and there he is!" I added, as a stout pull and vigorous splashing ensued in the strong water. However, it was not the true "neighbour," but a good sea-trout of 2 lbs.

Examples such as these prove that, provided there are fish in the water, one need not despair though it has been fished already by another. Very often it must happen that salmon move into a pool, or the taking place in a pool after one angler has fished it and before the next one comes. It is this element of chance which provides one of the chief charms of the sport.

The caprice of salmon is apparent not only at different hours, but on different days. An instance in point has occurred while these sheets are going through the press. Throughout October, 1897, a long drought prevailed, save for one short flood about the middle of the month, which brought a considerable number of salmon into the Tweed. Bright, summery weather followed, and little business was done with them; the river fell very low, and the fish could hardly be induced to rise. On Monday, November 2nd, thinking that the repose of Sunday might have put them in better mood, I fished part of Mertoun water; but the only result was that, on small grilse flies, I touched three fish, holding one of them for a few turns. Next day—as bright and hopeless as its forerunner—I surrendered my rod to a lady starving in the house,

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who fished for exactly one hour and landed two fish—30 lbs. and 18 lbs.! Never had a man his eye more neatly wiped.

In open water, free from rocks and snags, it is permissible to use two flies. It is usual to do so in fly-fishing for salmon in a lake, and, of course, adds to the chances of the fish perceiving the lure. But in a river the usual practice is to use only one fly, and any advantage that may be gained by using two is counterbalanced by the increased risk of fouling. Especial care is required in landing a fish hooked on the tail fly to prevent the bob fixing itself in the hat, the coat, or even the flesh of the gillie who gaffs it. I cannot remember any serious mishap from the use of a bob fly, though I have often used one when fish were either few and far between or rising badly. Once, indeed, the second fly gave me a very exciting bit of sport in the Luce. I had no attendant, and, having concealed an 18-lbs. fish which I killed near the sea, went up to the Abbey Pool, a mile or so higher up. Here I hooked a heavy fish, which at once began a series of extraordinary manœuvres. He lashed about on the surface and flew from side to side of the river, up and down, till he ran upon the top of a huge rock in midstream and lay flapping upon it. Then he rolled off again into the flood and rushed about in the same way, never going beneath the surface. His violence soon tired him out; I got a chance at him with the gaff, and pulled him out, a kipper of 24 lbs.; and then the cause of his mad behaviour was apparent. He had the bob fly fixed in his mouth, while the hook of the tail fly had entered the vent, so he was fast—bow and stern.

Use of two flies

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CHAPTER IV

KILLING A SALMON

ASSUMING that the art of fishing a salmon cast has been mastered, the next important knack to acquire is how to deal with a salmon when he condescends to rise at the fly. A very large number of fish hook themselves, especially in rivers, without breaking the surface or showing themselves above it. The first intimation the angler receives is a strong but elastic drag under water, imparting a delicious thrill to the nerves, and the only response required is to raise the rod nearly erect and keep a steady strain on the line. The question so often discussed—to strike or not to strike—is settled in such cases by the fish striking himself; that is to say, that in turning to descend after seizing the fly, he imbeds the barb of the hook in his mouth, especially if his own weight is supplemented by the force of a brisk current. But in still water, which, though tedious to fish, is often the best taking place in a river, if you are fishing with a very large hook and treble gut, there is probably some advantage in doing a little more than raising the rod into play, and,

Hooking a fish

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directly the fish is felt, a firm chuck may be given to ensure the steel going home.

The case requires different treatment when the motion of a fish is seen near the fly. This adds considerably to the pleasurable excitement of the rise, but it is also a far severer test of steadiness of nerve. The motion may be one of three kinds—a wave, a boil, or the display of the whole or part of the salmon above the surface. The man accustomed to trout-fishing will "strike on the rise," than which there can hardly be a more mischievous mistake in salmon-fishing. There ought not to be the slightest alteration of the movement of the rod *until after the fish is felt*, otherwise the fly will be drawn away before he has secured it. A salmon may rise and miss the fly repeatedly, and yet take it at the last, provided it is not snatched away from him; but if it is snatched away he seems to resent it, and generally refuses to return to the attack.

It is well known to fishermen that there is a far better chance of hooking a fish after he has been pricked than after he has been disappointed by the premature removal of the fly. Indeed, it is a common thing, especially in spring, when fish are bold, to feel one give a good sharp tug (it does not follow that he has been pricked in the mouth: he may have struck the hook or line in turning), and then to hook him at the next cast. But a fish which follows the fly round till the moment it is withdrawn for a fresh cast, is a "disappointed" fish, and it is very unlikely that he will show again. These are the fish which generally make the "wave" rise, and it is hard to acquire the coolness necessary to conduct the fly with the same even tenour through the slack water from the time the

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wave is seen, till the moment there is a stoppage of the line. Then the point should be smartly raised, and it usually turns out that these wave rises result in firm hooking.

The "boil" is sometimes caused by the stroke of the tail of a fish turning short at the fly. Never strike at the boil, as it is proper to do in trout-fishing. If the salmon has turned short, no harm is done and no good either; but it happens as often as not that the boil is caused by the fish rising to the surface and poising himself behind the fly before launching forward to seize it. I have repeatedly watched this kind of rise at another angler's fly from a high wooded bank on the North Tyne. If he struck on seeing the boil, the fly was snatched away from the fish, which sank to the bottom, and seldom offered another chance. He was a disappointed fish.

Most sporting of all rises is that in which a fish shows in whole or in part above the water. Sometimes he throws his whole beautiful body out; at other times he slips out quietly, first the head and then the tail; or again he will turn broadside uppermost and splash the water finely with a stroke of his strong propeller. Here again it is most important not to snatch the fly away too soon. The exact moment when the fish takes it is very uncertain, and it is far better to wait till he is felt before any attempt is made to strike. If it is done earlier, even if the fly is in the salmon's mouth, it may be pulled out of it; whereas after he has turned to descend, the tightening of the line fastens the hook all the firmer.

Striking a salmon is a very different affair from striking a trout. A trout is struck by a quick

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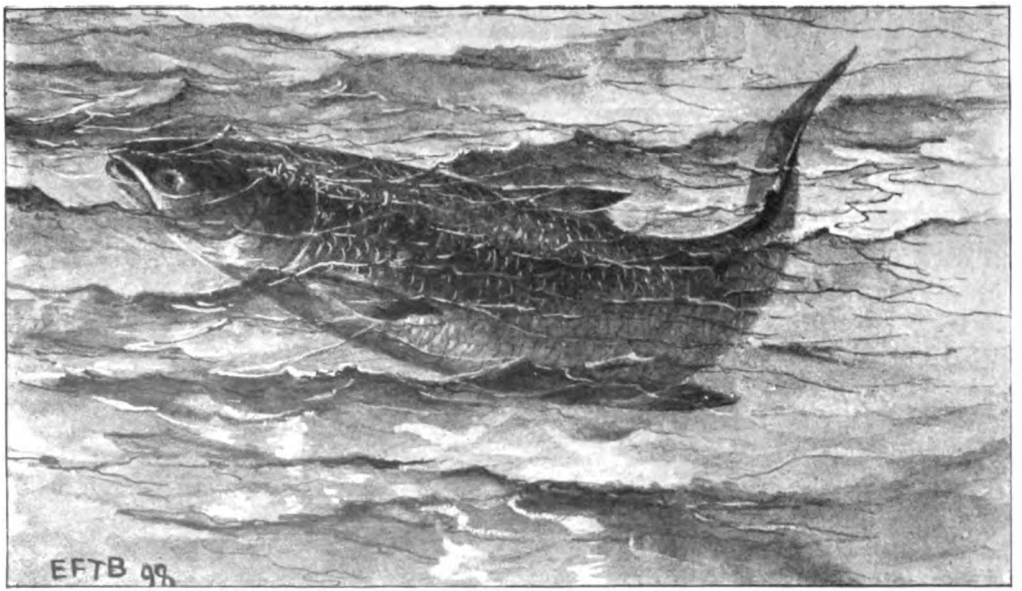

A Sporting Rise.

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motion of the wrist alone, without a finger on the line. In salmon-fishing, as above described, one finger should always be on the line—a sensitive finger, be it said, but firm enough to ensure embedding the hook. If the check of the reel is stiff enough to do this with certainty, then it is too stiff to give line freely to a fast running fish. "I never strike a salmon," says one fisher; "I always do," says another. Perhaps the action of both is pretty much the same at the psychological moment. Neither of them strikes in the sense that a trout is struck, because a salmon rod will not yield to wrist action in the same way as a light trout rod; but both, on feeling the fish, suddenly raise the rod in order to play him, and in this sense all salmon should be struck. Everything depends on its not being done too soon.

Playing a salmon

A resolute, experienced fisher, with trustworthy tackle, and no obstacle to prevent him keeping near and abreast of his fish, ought, as a rule, to be able to account for his quarry in from five to fifteen minutes, provided the fish is hooked fairly in the mouth. Of course, when a fish is able to run down below his captor, perhaps taking out a good deal of line, and it is impossible to follow him, an indefinite period may be spent in bringing him to bank. Or when a fish has been foul hooked by the tail or body, he may be able greatly to prolong the struggle. But under ordinary circumstances one minute per lb. in weight of the fish is a rough but just estimate of the time necessary to bring a fresh run salmon to bank. In order to accomplish this the angler must work hard from the moment the fish is struck. The first thing to do on hooking a salmon in a river is to

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shorten the line, if possible, and get abreast of the fish. In order to do so, the angler, if fishing from a boat, must be drawn ashore and land.[1] Grilse and small salmon may often be "rushed" by prompt treatment at first, and dragged ashore in a surprisingly short space of time; though this kind of treatment involves the risk of loss when very small hooks are used. But fish of 10 lbs. and upwards cannot be dealt with in a summary way, even with the strongest tackle. The utmost pressure that can be exerted on a fish by means of an 18-foot salmon rod does not exceed 3 lbs., a strain which every part of the tackle is capable of sustaining, provided it is sound. Although, therefore, a grilse of 6 lbs. may be dragged ashore by a pressure of half or a third of its own weight, just as one may see a stout lad dragged for a short distance by a high-spirited retriever, it is clearly out of the question to "rush" a 20-pounder by a pressure of 2 or 3 lbs.

It may be questioned, seeing that the utmost pressure that can be exerted through a salmon rod does not exceed 3 lbs. (a fact which anybody may easily test for himself), and that the gut, the reel line and the hook are capable of raising a dead weight of 8 lbs. (the average strength of good single salmon gut, wet and *including knots*), how the line ever comes to be broken by a fish. The explanation is that this occurs either from the jerk caused by a leaping fish descending, or because the strain is thrown not on the rod but on the line, when

[1] This applies to rivers like the Tweed, where it is always possible to land before killing a fish. In larger rivers, like the Shannon, or in lakes, the tactics are different, and the fish is gaffed from the boat.

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the rod is held at too wide an angle with the line. Perhaps the most common time for the line to part is at the moment of hooking a fish. That is accounted for by the position of the rod. Were it possible always to hold it at right angles to the current, the sudden strain would come on the rod, of which the elasticity would save the line from a jerk heavier than it can stand. Under some conditions it is quite possible to keep the rod well up stream, but in others the cast cannot be properly fished without bringing the point of the rod round after the fly, so that at the end of the cast the rod and line lie almost at the same angle to the fisher. In a swift river like the Spey it is impossible to keep the rod at anything approaching a right angle to the line, or the fly will drag on the surface of the current. The point of the rod must be brought round as the fly descends, and it requires great care to avoid a fatal jerk if a salmon seizes it at the end of the cast. The main thing is to prevent the rod and line being *exactly* in a straight line, so as to retain the advantage of some degree of resilience in the rod.

One other occasion, when even the soundest line may part, no matter in what position the rod is held, is when a fish has made a long run down or across the river, and turns suddenly to ascend. The line is deeply drowned, and there is a big bight in it; should the fish at this moment make a plunge or a swift dash forward, the drowned line acts like an anchor; the pressure does not come on the rod at all, but against the mass of water, and the weakest part of the line gives way.

As a rule, once the fish is hooked and has settled down to fight, and the angler has got

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opposite or slightly below him, he should not be allowed an instant of repose. There are two exceptions to this: first, when the fish has been hooked in such a place—the brink of a fall or above a bridge—whence it is imperative or highly desirable that he should not go down stream. There are such places in almost every river; a typical one occurs to mind in the Camisky water on the Lochy. Here there is a heavy cascade, and on the very verge of it (rather below the verge indeed, for it is actually within the descent), is a favourite lodge for salmon. One would say that nine fish out of every ten hooked at this spot must be swept over the fall, where it is exceedingly difficult and risky to follow them. The tyro might suppose that the only chance of saving fish and tackle would be to hold on like mischief and try to drag the salmon up stream. But such violent measures, though sometimes necessary as a last resource to stop a fish that has begun to run in a dangerous direction, are the reverse of the method to be followed with a fish hooked in such a place as this. As a matter of fact, comparatively few of the fish hooked on the brink of this Camisky fall do go over it. The right thing to do is to humour the fish at first; he may be led up stream a long way by a gentle pressure into safe water, where the steam may be put on at once. A salmon which has been at the pains to ascend such an obstacle as this waterfall is not the least likely to descend it on purpose; but if he is thrown into a flurry by over-vigorous handling at first, he may get into a position where the rush of water sweeps him over against his own wishes or intention.

The other circumstance in which it is proper to

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deal tenderly with a fish is when he rolls and lashes about on the surface after being hooked. Bull-trout (called sea-trout on the Tweed) are very prone to this manœuvre, and heavy salmon practise it also sometimes. It is best to keep a very light hold on a fish as long as he behaves thus; for if the line is hard held, a blow from the fish's tail is exceedingly apt either to tear the hook from its hold or to smash the gut. It is certainly the most dangerous device a salmon can resort to, though I do not agree with many who hold that it betokens a lightly-hooked fish. That it so often results in freedom is because it subjects the hold of the hook to strain in the greatest variety of directions; and it may be observed that a salmon tumbling about on the top of the water in this manner always keeps his mouth wide open. It is a very anxious time for the angler, and it is a vast relief when the creature goes below, and the old game of pully-hauly may be resumed.

It is a good maxim never to allow a fish to take a yard of line without fighting for it. It is a still better one not to let him have a yard at all, if it can be avoided by following him. Here is a case in point. The season of 1894 was an exceedingly poor one on most parts of the Tweed, but one day in October I happened to meet with a small school of fish in the Willow Bush stream in the Mertoun water. Now this cast is as free from subaqueous dangers as any that I know—a wide, even current, where it might be supposed safe to take liberties. I fished the tail of the pool first, where I got out two fish of 28 and 13 lbs. Then I began to fish down from the top, and landed two more salmon, 16 and 14 lbs., a grilse of 7 lbs. and a sea-trout of 9 lbs.,

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besides losing another grilse out of the net. We had worked down again to near where we began in the morning, and there was still an hour of daylight, when I got hold of something heavy which showed a strong inclination to go down stream. Now there was a fish or two rising below us, and, being exceedingly anxious not to disturb that part of the water, I fought hard to prevent my new acquaintance getting down to it. He was very strong, and resented opposition by moving slowly across the wide river, till he had something over fifty yards of line off the reel. I was not the least uneasy, for, believing the bottom to be perfectly clear of obstruction, there did not seem to be the slightest risk of fouling anything. Then the movement stopped; it seemed that the fish had lain down. I tried unsuccessfully to recover some line; presently it was obvious that it had fouled something in mid-channel, Stepping into the boat, I was rowed out to the spot, and found that there was nothing to do but pull at the line till it broke. It was a bitter, but salutary lesson. I had lost what was in all probability the biggest fish of the day, perhaps of several seasons, from over-anxiety about disturbing the water.

It may be observed that, in a full river where there is not much chance of a man on the bank being seen by fish in the channel, there is probably no mischief done by a hooked fish running among others. It is no rare thing to see a free fish curiously following one that has been hooked; indeed, I can testify to an instance which happened in the Bush, in the north of Ireland, when a friend of mine was playing a summer fish. A grilse came up to look on, and the gillie slipped

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the net under him, tossed him ashore, and then landed the hooked fish.

A great deal of misconception prevails about the operation called "giving the butt." Illustrators of works on angling have seldom been practical anglers, and their idea of giving the butt is to throw

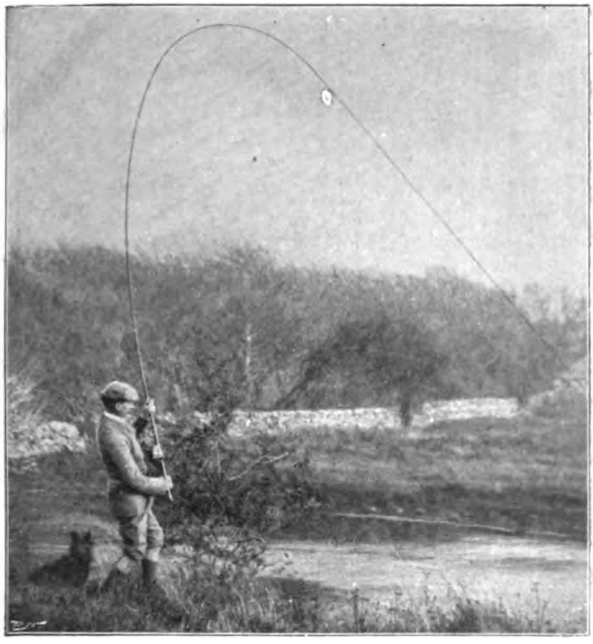

FIG. 35.—WRONG WAY TO GIVE THE BUTT.

the rod back over the shoulder and point the butt towards the fish (Fig. 35). Now the effect of this action is to take the strain *off* the butt and to concentrate it dangerously on the middle and top joints. The true position to bring the butt into play is when the rod is held towards

Giving the Butt

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the fish at an angle of about 45° (Fig. 36). If it is held much higher than this the strain falls on the upper part of the rod; lower than this, on the line. Sir Humphry Davy, as everybody knows, was an excellent salmon fisher, and described in terse and vigorous language the true way of giving the

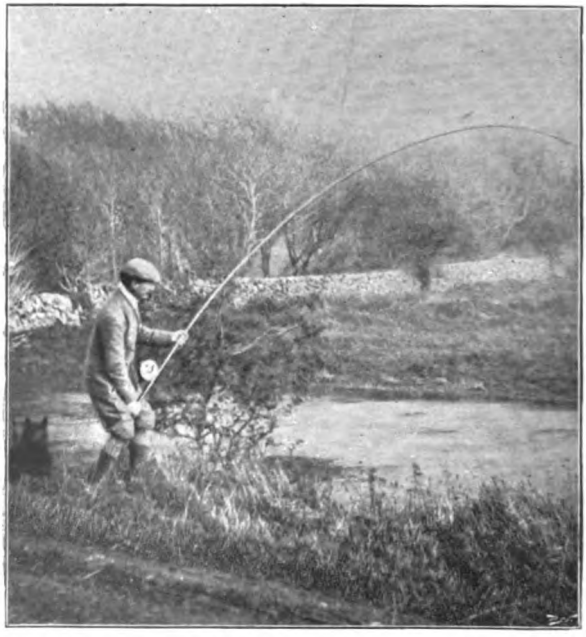

FIG. 36.—RIGHT WAY TO GIVE THE BUTT.

butt in his instructions to Sir Benjamin Brodie, who was playing a fish under his observation. "Keep your butt to your belly, Ben!" he shouted repeatedly; "keep your butt to your belly!"[1]

[1] Sir Benjamin was also the subject of the following story. He began his experience of salmon-fishing with a long series

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There is a prevalent misconception, too, about the attitude assumed by a fish when he is said to be sulking. The natural position of a resting salmon is horizontal, with his breast touching the bottom of the river, but this is a position which he cannot maintain when a pressure of from 1 to 3 lbs. is put on him through the line. One may fish a long time successfully, too, without obtaining optical proof of the real attitude of a sulking salmon, because many rivers in this country when in angling trim are dark or slightly turbid. But in perfectly clear water it may be seen easily that a sulking fish assumes an almost vertical position with his head down (Fig. 37). It follows, then, that if the strain is kept on him upwards, that is the direction in which he is best able to resist it. To move him from this posture of resistance and cause him to move about, an attempt should be made to get a side pull at him; or, where the physical character of the river banks permits, the angler should get below his fish, letting out some line if need be, and draw him down stream.

Old fishermen are very sceptical, and justly so, of the prodigiously prolonged struggles with salmon sometimes recorded, and, provided there are no

of disappointments. His professional duties allowed him to take no more than a brief holiday each year, too brief to enable him to overcome the persistent want of luck that followed him in fishing. At last the spell was broken; he hooked and landed a small fish in the Tweed, and, laying down his rod, gazed at it in delight, and apostrophised it in these words, "Ah, my bonny fellow! these six years have I been after you, and I have got you at last." "Hoots, Sir Benjamin," observed the boatman, "that's no possible. It's but a bit grilse—no aboon three year auld!"

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special features of difficulty in the river or on its banks, set the loss of time down to defective handling on the part of the sportsman. Nevertheless, once in a blue moon it may happen that a heavy

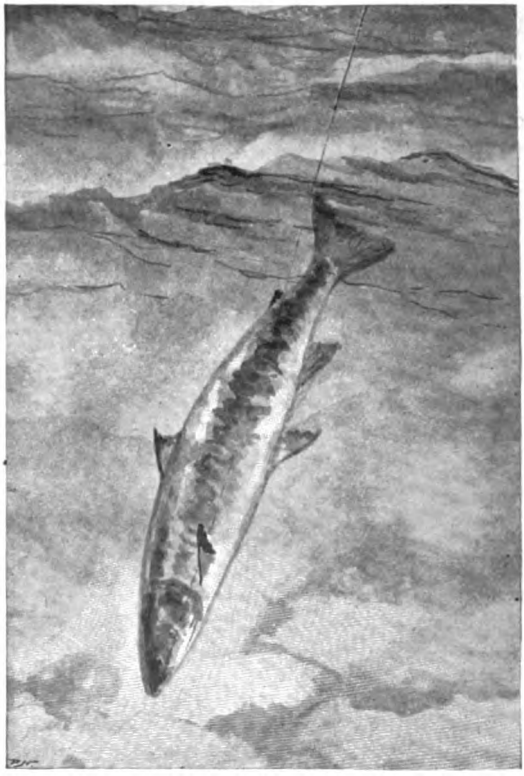

FIG. 37.—POSITION OF A SULKING SALMON.

fish shows unusual powers of resistance, and the most vigorous treatment fails to bring the fight to an early conclusion. I was fishing the Luce on an autumn day in 1870. In the morning I

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killed a grilse of 6 lbs. in the stream of Craig Corner, and touched nothing more till I returned to the same place at two o'clock. I was fast in a heavy fish at once, which moved steadily down to some deep dead water where the river turns nearly at a right angle. There he sulked: I hauled and pulled at him; my gillie threw a barrow load of stones to stir him; the only notice we got was an occasional shift of position when a boulder fell uncomfortably near his nose; a little, leisurely tour, and he was back again to his place. I had not got a glimpse of him, and after half an hour spent in these tactics, began to suspect he was something out of the common. Well, I sawed, and tugged, and jerked at him impatiently, for it was a fine fishing day, and the afternoon was slipping away. I gave him all that single gut was capable to stand, yet it was a quarter to five before I managed to get him down the ford; my gillie waded in and gaffed him in mid stream—a red kipper of 22 lbs., fairly hooked in the mouth, but a long way back. To this day I cannot account for the resistance of this fish; but this happened a quarter of a century ago, and in the interval I have learnt how to treat an obstinate customer like this. He should be hand-lined. The rod should be given to the gillie as often as the fish lies down; the line taken gently in the hand, and a steady low pull *must* stir him, provided there are no rocks to foul.

At all events, it is better to try this before attempting a device to which a friend of mine once had recourse with a sulky fish in the Bladenoch. He, too, had caused plenty of stones to be heaved in, without much avail, and began to lose patience with the salmon. He had fished

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much in Norway, and was not of a mind to be kept half a day by a Scottish fish. He had in his pocket a bunch of keys—the keys of his most cherished repositories—on a ring, which opened in such a manner as to admit the line. This bunch he sent rattling down on the top of the fish's head, which caused him to make a fine run, at the end of which the hold gave way; back came the fly, minus the fish—*and the keys.*

Whatever device be resorted to for starting a sulky fish it should be borne in mind that he is not lying horizontally below the water, but as near vertically as he can get; whence it follows that the best chance of moving him is by a low side pull.

Lake salmon-fishing

The only advantages which fly-fishing in a lake for salmon presents over river-fishing are to be found in the nature of the rise and the boldness with which fish run when they have plenty of sea room. In fly-fishing from a boat, as long casting is superfluous and undesirable, the rod ought not to exceed 15 or 16 feet in length. But not less than 120 or 130 yards of line should be on the reel, for a fish hooked near the shore will often make an amazing run into the deep water. Still greater is the necessity for plenty of rope where there is a chance of hooking a fish from the shore or in wading. Such a chance should never be lost, for it is under such exceptional circumstances that the salmon shows his full capacity for fight, with plenty of sea room, and with his would-be captor rooted to the spot. It is not every lake frequented by salmon that contains any part that can be fished without a boat; but at the embouchures of rivers, or at a

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reasonable distance from a rocky shore, there often are lodges whither salmon resort year after year. These should always be tried before going over them in a boat; and when he does try them, let the fisherman make sure that there is no dangling watch chain or baggy coat cuff to interfere with the freest action of the reel. The courageous and prolonged dash for the deep of a salmon hooked from the shore supplies the supreme sensation in the angler's experience.

It will be generally admitted that lake-angling is deficient in much of that variety which makes the mere act of fishing a pretty stream an agreeable labour. Nevertheless, in one respect it has the advantage, inasmuch as nearly every fish that rises shows itself. The reason for this is the more rapid rate at which it is necessary to move the fly in order to keep it near the surface. This induces the salmon to come at it with greater dash than in running water, where the fly, especially at "the hang"—the most deadly period of the whole cast, is often nearly stationary. When a salmon rises in a lake he must generally break the surface, even if it be only a boil. Sometimes he executes a lovely head and tail rise, slipping in and out of the surface so gently that it is a delightful surprise to feel the line tighten and to hear the reel whirring. Or again he comes out of the side of a great wave, launching himself across the trough, and carries down the fly with a wild flourish of his broad tail.

It is the boatman's duty to follow the fish when hooked; to wait till the first fury of conflict is over, then to drop anchor and stand by with the gaff.

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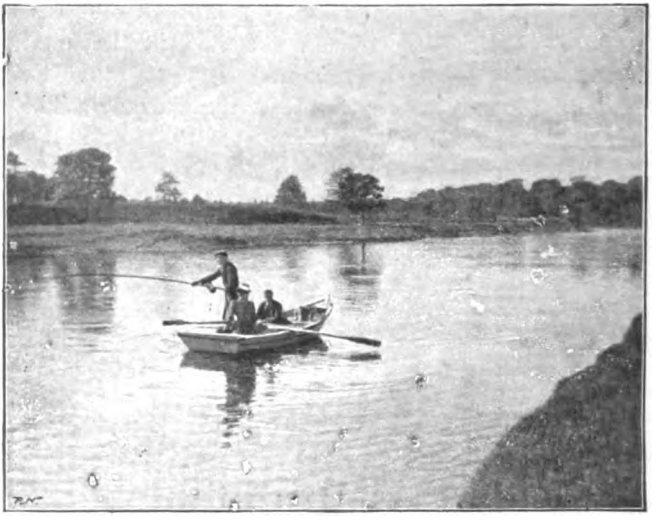
There is no harm in fishing in a take with two flies; indeed, it is to be commended, because a salmon lying in a broad expanse of water may catch sight of one fly when the other escapes his notice, or, as sometimes happens, may be hooked by the tail fly when rising at the bob. The flies should be about a yard or four feet apart, and much care should be exercised when the fish is getting tired. At such a moment a salmon often endeavours to get under the boat, as if seeking shelter in the shade, and trouble must ensue if the disengaged fly catches on the bottom of it.



ON THE TWEED AT MERTOUN.

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CHAPTER V

SALMON FLIES

THE subject of salmon flies is one which the fisherman who ventures to think for himself, and to apply the ordinary principles of evidence to the problem, approaches with considerable trepidation. Some years ago, greatly daring, I presumed to put into words what is undoubtedly the opinion of a great many experienced and successful salmon-fishers; namely, that the degree of discrimination between flies of different colours and patterns attributed to salmon is preposterously exaggerated.[1] The views which I then expressed, founded on observation conducted on very many rivers and extending over a longer series of years than it is quite pleasant to contemplate, met with a great deal of criticism. They were denounced vigorously by some anglers, in conversation, in correspondence and in various periodicals; from others they received confirmation and approval, either in whole or in part. I must not be held disrespectful to those who differ from me, many of whom have had equal or superior

Heresy about salmon flies

[1] *Post Meridiana*, p. 321. Blackwood and Sons, 1895.

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opportunities of forming an independent opinion, if, having undertaken to write a volume on salmon-fishing, I am bold enough to adhere to these views, having met with nothing since they were first pronounced to modify their general character. It cannot be denied that they are at variance with opinions popularly entertained; and I am neither vain enough to expect to influence these opinions, nor sanguine enough to hope that anglers in general will shake themselves sufficiently free from tradition and prejudice to arrive independently at the same conclusion. Nevertheless, it is encouraging to be able to claim the sympathy and approval of the author of one of the very best books on sport and natural history recently published.

Mr. Abel Chapman, with whom I have not the honour of being personally acquainted, nor have ever held any communication of any sort, writes thus in *Wild Norway*[1]:—

"Salmon . . . . never take a fly as such—that is, as an insect—nor as *food* at all. For salmon do not require to feed in fresh waters. They may, and do, from sheer idleness, mischief, or curiosity . . . . snatch at and swallow some darting creature or living object they may chance to see passing by or overheard—say a 'Blue Doctor' or an 'Angel.' But that is not feeding; they do not feed in the sense of nourishing their bodies. What nourishment they need during their sojourn in rivers is derived from the abundant reserve of fat or 'curd,' with which high living at sea has interlarded the flakes and overlaid the flanks of a new-run salmon.

"If there are those who still hold that salmon 'feed' while in fresh water, let them consider what that hypothesis involves. Salmon ascend favourite streams in shoals; they are by nature rapacious and voracious—their build and

[1] London, Edward Arnold, 1897.

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equipment show this, as well as the rapidity with which they recover condition and put on flesh at sea. What is there in any river to satisfy hundreds of such appetites? If they required to be so satisfied, a single week's ravages would clear out every living thing in the water. . . . . No; every trout, smolt, or eel, every duck, moor-hen, and water-rat, would speedily be swept up—in a week small boys would hardly be safe. Consider also that salmon loses condition, strength and fighting power from the moment he enters fresh water, while his stomach and digestive organs shrivel away with disuse.

"Why salmon take a fly, or what they mistake it for, are perennial problems. But all that is immaterial to our present point. Certainly there is no form of life in fresh water that in any degree resembles a 'salmon fly,' and the assumption therefore is not unreasonable that the fish take the fly or other lure for some object on which they have been accustomed to prey whilst in salt water. The tinsel and gaudy feathers, it may be, recall pleasant memories of the week or month before, and *Salmo salar*, with reawakened rapacity, but without pausing to consider the anomaly of thus finding a prawn inland, or a starfish stemming a rapid, dashes at the intruder, and gets the hook."

Now it is a mischievous practice to make frequent quotations, especially at such length as the one above; but the question involved is of so much moment to salmon-fishers, the theories which surround it so dogmatic and complex, and the practice founded thereon so bewilderingly irrational, that I have preferred to cite such an accomplished naturalist as Mr. Chapman, rather than repeat or give extracts from what I have written already on the subject.

But I will go one step further than I have hitherto ventured. Many anglers are fond of nature and natural history, but comparatively few anglers are naturalists—that is, men who are in the habit of assuming nothing, of speculating warily,

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and of founding their beliefs on the carefully recorded, observations of themselves and others *submitted to the test of scientific method.* Here, for instance, is the sort of evidence one hears about the fastidious discrimination in colour shown by salmon. A. B. begins fishing with a fly in which the prevailing colour is red ; after persevering some time without success, he exchanges it for one chiefly blue in colour, and immediately begins to have sport. This is accepted as proof that (1) salmon can distinguish between red and blue, and (2) that in this river, or, at least, on this day, they are on the look-out for something blue, and disdain red. But if such proof as this were sufficient for men of scientific method, then we should all be compelled to believe in ghost stories, of which there are many supported by testimony far more nearly approaching completeness. If A. B. found that on several consecutive days he could not kill fish on a red fly and could do so on a blue, then it must be admitted that the preference of salmon for blue might be considered extremely probable, at least in that river. But no such evidence is ever to be had because A. B. never deserts the fly that is bringing him sport, and C.D., E.F., and as many as the rest of the alphabet as happen to be in the neighbourhood, hearing of his luck, immediately ask, "What fly did he use?" and forthwith mount flies of the same character.

The popular theory encourages the extraordinary delusion that every river requires its peculiar combinations of silk, wool, tinsel and feathers to take the salmon which frequent it. Thus we have Tweed flies, Tay flies, Spey flies, Usk flies, Shannon flies, none of which it is orthodox to use on any stream

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except that whence it derived its origin. The late Mr. Francis Francis, in his entertaining *Book on Angling*, gave lists of hundreds of different patterns, peculiarly suited, as was supposed, to most of the rivers in the United Kingdom. In addition to these there was a catalogue of seventeen "general" flies, reputed to be effective everywhere. Strange to say, in the sixth edition of this work, published only a dozen years since—in 1885—some of the patterns now most universally used find no place among the general flies. Thus Jock Scott and Wilkinson, which perhaps enjoy a wider reputation at the present day than any others, were classed by Mr. Francis as Tweed flies.

Delusions about special patterns

I think I may claim to have introduced the Jock Scott for the first time to the notice of Tyneside salmon. At that time—it was in 1867—nothing was permitted but sober greys, dun turkeys, and brown mallards. The gaudy, flaunting lures from neighbouring Tweedside were declared to be useless. This, methought, was very strange, seeing that Tweed and Tyne salmon enter the sea through estuaries not very far apart, and must occasionally partake of similar diet during their pelagic sojourn. Being at that time very fond of tying my own flies, and bright flies being more amusing to tie than dull ones, my boxes were stored chiefly with patterns like jubilee illuminations. Now it is far more satisfactory to kill fish on flies of one's own composition, so I audaciously disregarded the warnings of the worthy landlord of the Chipchase Arms at Wark,[1] who guided me to the pools, and met with brilliant success with Jock Scott and other

[1] Tyneside, not Tweedside, Wark.

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flaring insects. At the present day bright flies are as fashionable in the Tyne as anywhere else, the Thunder-and-Lightning holding the palm, as they tell me. They also say that the one fly which will *not* do on the North Tyne is the Blue Doctor. It is no great pet of mine, but I only wish I might have as much fishing as I would like on that charming river on condition of using nothing but a Blue Doctor. I should await the result with considerable confidence.

Altered character of Tweed flies

Bright flies are all the rage on the Tweed just now; no contrast so startling, no dyes too brilliant, no tinsel too brightly flashing, to recommend a lure to the judgment of anglers and (what is far more important) to boatmen—of all tyrants the most autocratic. The Durham Ranger, the Dandy, the Wilkinson, the Silver Grey are prime favourites at present, and are not likely to be superseded until some more dazzling combination can be devised. Yet when Thomas Todd Stoddart was prescribing, some half century ago, for that fair stream which he knew and loved so well, how he charged his disciples to display none but sober hues! allowing them, as an extreme indulgence, a scarlet tag to a Toppy or a flash of orange in the Drake Wing. Where are now the old-fashioned tawny turkeys which used to supply the Dun Wing and White Tip, once reputed indispensable to the Tweed angler? The very birds are scarcely to be found: the breed of them has been suffered to die out; which matters less to salmon-fishers on Tweedside, because no boatmen with any reputation to lose would permit one to be exhibited on the Dubs. Is it not comical, in years when silver bodies of the brightest are reckoned

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the most taking, to read Stoddart's instruction for furnishing a certain fly, in which he permits, as a hazardous luxury, a ribbing of silver tinsel, *provided it is tarnished*, and to mark his warnings against the display of gaudy Irish patterns in Scottish waters?

It is the same on every other river where quietly coloured flies were once in vogue. A log of the Thurso fishings was begun more than forty years ago by the late Mr. Dunbar, the founder of its fame as an angling river, and has been kept carefully ever since. From this it appears that, throughout the fifties, green and purple were the colours on which most reliance was placed for spring fishing, and multitudes of salmon succumbed to their attractions.[1] At the present day the flies invariably used in the early season remind one of the Northumberland miner's taste in handkerchiefs—"Nane o' yer doomed gaedy collours; just gie me plain reed and yally!"

Francis Francis was very diligent in collecting local patterns of flies all over the kingdom. On pages 354 to 357 of his book, alluded to above (sixth edition), may be found the most esteemed kinds from the south-west of Scotland sent to him by myself about the year 1870. And what do they show? Why, that in those days plain mallard and

[1] A change had come over the taste (of the fish, of course!) before Francis prescribed for this river. "The fish," he writes in his edition of 1886, "have undergone a complete change in their tastes since I was there; for when I was there they preferred a sober-coloured fly, but of late years they prefer more showy ones." Can credulity be more *naïve* than this? or was Mr. Francis writing with his tongue in his cheek?

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turkey wings with woollen bodies were in vogue in that district, and that bright dressings were at a discount; whereas now I should mount for choice in the same streams the gaudiest flies in my box. Instances might be multiplied to any extent of rivers where it was once held that salmon would not look at anything save what the long experience of local anglers had enabled them to devise to meet the peculiar fancy of the fish. Figs. *d* and *e* on Plate I. represent two flies in my possession, the Admiral and the Rear Admiral, which were tied and killed fish more than fifty years ago. They were revealed to me as a precious secret by the late Admiral Sir Houston Stewart, who attributed a great deal of his remarkable success as a salmon-fisher to the invention and use of these invaluable lures. Yet they are not flies such as many modern anglers would greatly care to attach to their lines.

Origin of local patterns

The fact is that nearly all local patterns in Great Britain were originally of dull or sober hues, because material of that kind of colouring came most naturally to hand for people living far from towns. The turkey in the yard, the mallard on the loch, the grouse on the moor—supplied the feathers, and any old bit of carpet contained crewels of varied if not very brilliant dyes. Hooks dressed with humble materials such as these killed plenty of fish; wandering anglers consulted local experts and bought what flies were to be had; and so, to this day, archaic and modest lures hold their own in certain streams, to the exclusion of what would certainly kill as surely, though perhaps not more so. It was otherwise in Ireland. There, it seems, the æsthetic delight of the Celt in beautiful fabrics and rich or

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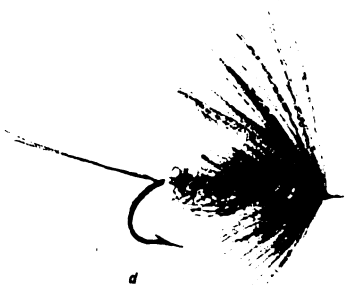
a

b

c

a. b c STODDART'S PATTERNS, HALF SIZE.



d

THE ADMIRAL

e

THE REAR ADMIRAL

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delicate colouring affected the character of salmon flies at a very early date, and, on Scottish streams an "Irish pattern" remained for many years a synonym for a gaudy fly.

Now what is the fair deduction from all this? Are we to conclude that the predilections of salmon have been revolutionised in the course of a single human generation? Is it the case that the chances of success with the old-fashioned greys and browns would be less if they were substituted to-day for the fashionable scarlets and golds, blues and silvers? Do we attract to our hooks a larger proportion of the fish in any stream than was done by our ancestors? I can only answer that for my own part I would feel as confident of success with the old type of fly as with the new, or *vice versa*. In fact, the cold, unromantic conclusion to which many observant anglers have come is this—that the colour and material of a fly matters very little, *if anything*, while the size and movement thereof is all important.

Have salmon changed their tastes?

It would indeed be very strange were it otherwise. It is only exceptionally that a salmon can see the fly presented to him against a dark background which may throw the colours into relief. This can only happen when some cliff or overhanging tree interferes between the fish and the sky. At all other times the fly floats between the salmon and the source of light—the sky. Hold up a salmon fly, say a Dandy or a Durham Ranger, between your eye and the sky, and you will find that most of the colour disappears. The only parts which show bright hues are those which transmit the coloured rays—the fibres of dyed hackles and of

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coloured wool. All the rest appears in dark silhouette—your delicate floss silk body, your blue chatterer or kingfisher plumes, your jungle fowl, the dyed fibres so minutely prescribed for your mixed wing; for all these, being opaque, cannot *transmit* rays, they can only *reflect* them, and this cannot be done in the direction of the beholder, when the light comes almost entirely from the other side of the object beheld.

The theory, therefore, that anything can be gained by the ingenuity displayed in fashioning salmon flies rests on the following hypotheses:—

1. That it is necessary to attract the salmon by a laboriously constructed imitation of some insect or other animal unknown.

2. That the salmon possesses the faculty of discerning, not only shades of light and dark, but differences in the coloured rays of light.

3. That, having that faculty, the salmon is endowed with the further one of exercising it under circumstances which totally prevent the perception of reflected light by the human eye.

Now let us consider these three propositions very briefly.

The first seems hardly tenable by any reflecting individual. How can one imitate what one has never seen and does not know to exist? How can one predicate that a Wilkinson resembles more closely than a Butcher some object desired by the salmon? The question has only to be asked to show its absurdity. One knows by experience, says some one. I deny it. I deny that any such conclusion can be arrived at by the right analysis of experience. All that experience has ever taught me about

What does a salmon fly represent?

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salmon flies is this, that the only fly on which you can expect to take fish is the one that happens to be at the end of your line; and that if you choose to fish ten times as often with a Wilkinson as with any other fly, you will probably catch ten times as many fish with it. But the true reading of such experience would not be that salmon preferred the Wilkinson, or were more easily attracted by it than by any other pattern. It would be that you had a greater faith in it than in other flies.

The Butcher, once a hot favourite, is not often displayed on the Tweed nowadays. On October 12th, 1887, I happened to begin fishing in that river with a small Butcher. I landed a fish. "Put on a Wilkinson," urged the boatman. "Why?" I asked. "Because it is a far better fly than the Butcher when the water is cold," said he. I was not disposed to be at the trouble of changing, and kept on the Butcher, with which I landed four more salmon. "Five fish on the little Butcher—not bad!" I observed. "If you'd been fishing the Wilkinson you might ha' had ten," was the unanswerable response. To please my friend I then put on a Wilkinson, and landed a sixth fish. The only lesson that I could deduce from this day's experience was that it didn't matter a hayseed whether one fished with a Butcher or a Wilkinson, or any other fly in the whole repertory, provided it was of a suitable size, not too small to escape observation, and not too large to arouse suspicion.[1]

The second hypothesis, by which it is assumed

[1] A great many of these illustrative anecdotes, it will be noticed, are taken from Tweedside, because, of all the rivers I have ever fished, it is there that local authorities are most dogmatic.

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that salmon possess the sensation of colour, rests on somewhat dubious evidence; it is capable of demonstration only by the labours of the anatomist. Dr. Gunther has shown as is noted below (p. 130), that fish apparently do possess a colour organ; but it cannot be assumed that they can detect colour in an object placed between them and the light in such a position as would prevent the coloured rays affecting the human retina.

The colour sense of salmon

How, then, it may be asked, does a certain fly obtain a well-deserved reputation as a good killer? Probably no pattern ever exacted more widespread respect than the Jock Scott, of which a cut of the original fly is given in Fig. 38. It was tied in 1845 during a voyage to Norway by Jock Scott, fisherman to Lord John Scott, and is now in the possession of Mr. Young of Glendoune, near Girvan. Twenty years ago it was considered indispensable to success on the Tweed,[1] until its glories were eclipsed by the more meretricious display of the Wilkinson, a fly which held the field in that river for many seasons and still holds it, in partnership with the Silver Grey and the more sombre Sir Richard. The explanation is very easy to any one who will reflect dispassionately on the limitations of human intelligence. A certain fly, say Jock Scott, Wilkinson or Durham Ranger, is devised by a tasteful dresser, and pleases the eye of some angler, who imagines that what tickles his fancy will prove attractive to the salmon. If fish happen to be about and "on the job" the first time the fly is wetted, very good sport may be

Origin of "Jock Scott"

[1] Colonel the Honourable William Home killed his 51 lbs. salmon in Carham Dub on a double-hooked Jock Scott.

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obtained; perhaps an unusual number may be landed. If that is so, the news spreads of a wonderful novelty in flies; for fishermen, though doggedly

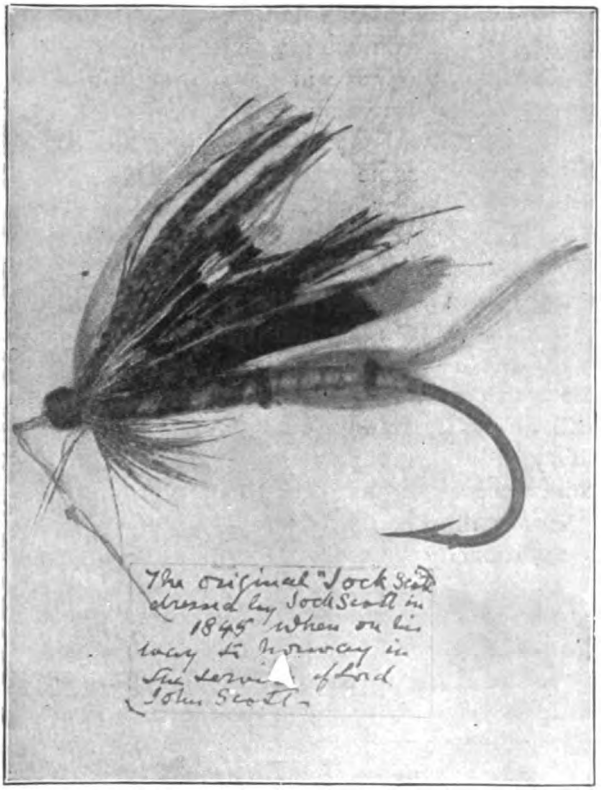

FIG. 38.

conservative in many things, are like the Athenians of old (and of the present day) always on the look-out for some new thing. Possibly eight or ten fish have been landed by some lucky angler in a single

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day *on the same fly*. It must surely be one of extraordinary attractions. It does not seem to occur to anybody that this fly, when taken out of the mouth of the last fish in the evening—chewed, discoloured, reft of half its fibres—is very different in appearance from the glossy, glittering fabric that sped across the wave in the morning; and it is impossible to *prove*, though it may be suspected by minds tinged with cynicism, that had the fly been exchanged for some other pattern each time a fish was landed, similar results would have been attained. Consequently tackle-makers are besieged with orders for the new fly; it is used far more frequently than any other pattern, with the result that it captures far more fish than any other; its reputation is firmly established, and endures, till the same combination of circumstances brings a still newer fly into favour. Every angler of, say, thirty years' experience must have witnessed such things occur over and over again.

The "Sir Herbert"

About nine or ten years ago I was so vexed by the pertinacity with which the infallible attractions of the silver Wilkinson were insisted on by Tweed boatmen, who were dissatisfied if I pleased my own inclination in the choice of a fly, that I resolved to devise a gold-bodied fly that should resemble no other that I have ever seen, and yet prove as successful as any other. In those days of more liberal leisure I spent much time in the delightful recreation of fly-dressing and I contrived and executed the animal described as No. 10 on p. 153.[1]

[1] I gave this pattern to Mr. James Wright, of Sprouston and Princes Street, Edinburgh, second to no other artist as a "busker," who named it after me the "Sir Herbert."

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It is a most dazzling creature, almost more delicately brilliant than any other known to me. The orange hackle over the gold tinsel and the crimson hackle over the scarlet wool, in conjunction with the tippets in the wing, give it a flame-like appearance. When I showed it to an old professional friend on the Tweed, he shook his head and said—"Weil, it *might* do when the water's coloured, but no' the day. Ye maun hae a Wilkinson." "Wilkinson be—immortalised!" I replied. "I am going to give this fellow a trial."

Well, the result was somewhat short of brilliant. I hooked a fish in the Burnfoot in the Dryburgh water, which by some mishap broke me. I raised another fish there and then went down to Jocky's Hole, where I killed a small fish of 11 lbs., and did nothing more that day. Of course the fisherman believes to this day that if I had stuck to the Wilkinson I might have had half-a-dozen.

Next week (this was in 1889) I fished the Nith one day from Drumlanrig. Now this lovely stream has been so harshly treated in the matter of nets that fish are lamentably scarce. The Duke proposed that I should go grouse-driving. I pled for leave to fish instead. "Oh, you may fish," said he; "but we have only four or five fish in the water, and they all have names, and know us as well as we know them." **The Nith**

Rather disheartened by this, I started with a small double-hooked specimen of the fly described above, though the keeper recommended a sombre local pattern. In the second pool visited, the Quarry Hole, I landed a lovely 20-lb. fish, fresh from the sea, and hooked another in the throat of Whitehill. Then, in the stream above Thornhill

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bridge, I put on a Wilkinson, and killed a second twenty-pounder, as handsome as the first. I was greatly provoked that I had not stuck to my own pattern, for this day broke all recent record of sport in the Nith. Since that time this gold-bodied fly has proved fully equal to any other in many rivers where I have used it.

Were I disposed to believe in the attractions of one fly over another, the following experience might have convinced me of the superiority of this particular pattern. On November 2nd, 1892, in the Halyweil at Bemersyde, I landed seven salmon weighing 22, 22, 20, 18, 16, 16, and 8 lbs.; on the 3rd, one fish of 18 lbs. at Merton; on the 4th, one fish of 28 lbs., also at Merton, all on the gold fly. Returning to Merton on November 17th, I landed four fish, of which two were on the gold body and two on the Wilkinson.[1]

The Tweed

On the 18th my beat was Cromweil, at the top of the Bemersyde water. It is seldom a very productive cast, though a favourite one with me, because of the fine sport fish show in the wide rough and shallow rapids of the Gateheugh. The river being rather low, I put up a very small "Sir Herbert, and killed two fish of 26 lbs. and 16 lbs. A friend was fishing the beat below—the Halyweil—a great harbour for fish at all seasons, and having fished my water once down, I went to see how he had prospered. There was a good head of fish in the river that autumn, and it would not have surprised me in the least had he landed six or

[1] I do not recommend the "Sir Herbert" for this reason, that the hackle lying over the tinsel is very apt to be cut. On this occasion, recourse was had to a Wilkinson, because the only "Sir Herbert" of the right size had been destroyed.

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eight. To my astonishment he had not stirred a fin.

"What are you fishing with?" I asked.

"A Silver Grey," said he.

"Wrong!" said I, without the *least* belief in what I was saying; "you should try this,"—handing him the very fly with which I had just killed two salmon.

He took it and began to fish with it. It was now about 2.30, and I left him to return to my own beat. Hardly had I gone fifty yards when I heard a shout, and, looking round, saw that he was fast in a fish. He landed it, then a second, and hooked a third—all on the gold fly, and these were *the only fish he saw all day*. Now I am as firmly convinced as one can be of anything incapable of proof, that, had he continued with his Silver Grey, he would have got these fish all the same. But it is vain to convince others of the vanity of trying to match the mood of salmon by varying the fly, and almost equally vain to determine to stick to one single pattern, so inflexible is the general opinion against such a course.

Difficulty of experiments on salmon

The fact is salmon are too vagrant, too capricious, and lie too deep to allow of satisfactory experiment. They are here to-day and gone to-morrow. Half—far more than half—of their time in fresh water, probably is spent asleep or dozing. This is as difficult to prove as their inability to detect much difference in the colours of flies presented to them, because a salmon, like most other fish, is not only unable to take forty winks, but he can't make one! He has no lids to his eyes, and never can close them. If,

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as may be reasonably supposed, salmon lie asleep for hours or even days together, it may be imagined how futile is much of the angler's toil. He may have changed his fly for the twentieth time, when suddenly a fish awakes, rubs his eyes, looks round and above him, sees a dancing, darting object and goes for it. The right fly has been found at last! "What a fool that fellow was who tried to persuade me there was no merit in changing!" thinks the exultant fisherman.

Salmon lie deep, generally out of sight, for they cannot, or, at least, do not, balance themselves in midwater or near the surface like a trout, but must rest with their bosoms on the bottom or on a rock. For this reason it is not easy to experiment on their preference for one colour over another, or to test whether they have any perception of colour. But the same difficulty does not interfere with experiments on trout in the clear streams of the south of England, where the dry fly has to be employed and the behaviour and action of a fish towards the lure presented to it can be plainly seen. Therefore, in order to bring the matter to a trial, I resolved to exhibit to such trout flies closely resembling in size, shape, and *shade* those that they were feeding on, but totally different in *colour*. It seemed to me that if the fish took these brilliantly dyed counterfeits as readily as brown or grey imitations, the inference would be legitimate—either that they failed to perceive the difference, or that, perceiving it, they disregarded it. It is scarcely necessary to observe that deliberate disregard of such a conspicuous feature as the colour of an artificial fly would constitute behaviour so strangely at variance with the unrivalled wariness

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and watchfulness of south country trout as to be well-nigh incredible.

When large trout are on the rise, the angler is generally in a condition of eager excitement, unwilling to waste the precious moments in philosophic experiments. But, having succeeded recently in carrying out such experiments, and believing that experiments of similar precision have not been conducted or, at least, recorded before, I venture to reprint here the report drawn up immediately afterwards for the *Field* newspaper (June 19th, 1897).

"A few years ago, while commenting in a magazine article on the extravagant importance attached by many salmon-fishers to the exact colours displayed in artificial flies, I ventured to express some doubt whether fish in general, and salmon in particular, were able to distinguish difference in the colour of objects presented to their view, especially when these objects came between their lidless, browless eyes and the light. While admitting, what no one can doubt, the intense keenness of their vision, and the readiness with which they can detect variations in shade or tone, from light to dark, and *vice versa*, I suggested that it was wholly an assumption that fish have the faculty of distinguishing one colour from another of a corresponding shade—say, red from green, or blue from brown. I observed that, although the organ of colour had been identified in the human eye with a delicate membrane, composed of processes like rods and cones, vibrating in groups in response to variously coloured rays, and transmitting the sensation of colour to the sensorium through the optic nerve, no such organ (so

The colour sense in fish

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far at least as my limited information went) had been recognised in the eye of any fish.[1] I pointed out that the absence of a special colour organ would be evidence of insensibility to colour, and that, so far as I know, nothing had been discovered to show that fish were not colour blind. Then, after discussing the futility of *a priori* theories of the preference felt by salmon for certain colours in certain rivers, and for other colours in other rivers, I made the following proposition :

"Let some floating Mayflies be dyed of a bright scarlet—they will reflect about the same amount of light as the ordinary yellowish-grey imitations—and let some devoted searcher for truth use one in a southern stream what time the Mayfly is on, and the big trout are sucking down the floating insects by scores. If it were found that the highly educated, nervous trout of an English chalk stream showed themselves as ready to accept scarlet, pink, sky-blue, or yellow imitations as the ordinary grey or green drakes, one might surely argue thence that fish have no discriminating sense of colour, and the

[1] The following passage from Professor Günther's "*Study of Fishes*," seems to indicate that there is an apparatus in the eyes of fish to transmit impressions of colour. The reference here is to the eye of the perch, a fish considerably higher in the scale of *Teleostei* than the salmon.

"The retina is a membrane into which the optic nerve penetrates, and in which its terminal filaments are distributed. The outermost is an extremely delicate membrane, followed by a layer of nerve cells, from which the terminal filaments issue, passing through the several granular strata, on which the innermost stratum rests. *This stratum is composed of cylindrical rods, vertically arranged, between which twin fusiform corpuscles are intercalated.* This last layer is thickly covered by a dark pigment."

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whole theory and practice of fly-fishing would be subverted.

"It so happens that since that time I have had little or no Mayfly fishing, having worked chiefly on the upper Itchen, above where the Mayfly comes. But during the present season I have been fishing in Hertfordshire, and have enjoyed an excellent opportunity of making the experiment suggested above, with results sufficiently remarkable to justify their being recorded in your columns. I had some Mayflies dressed with scarlet and others with blue in various shades on bodies, wings, and hackles. There was some difficulty in getting the dressers to understand that it was important that the shade of these flies should not be uniform; that there should be dark patches at the head and shoulders, and dark markings on the wings. In short, that a red Mayfly, when photographed, should appear exactly like a grey one. At last, however, a satisfactory result was obtained.

"On June 3, after the Mayfly had been on for about a fortnight, I went to fish the Gade. Meeting the keeper by appointment about noon, I found the Mayfly abundant, and the trout, which are exceedingly numerous, taking them freely. I had no desire that the keeper should suspect me at once of being a lunatic, so I mounted a fly of the ordinary pattern, with which I landed a brace of trout. Then I broached the subject of the dangerous flies, and told my guide that I wished to try some experiments. There was a good light-coloured trout lying above the bridge in the park in a convenient position. He was near the surface, though I did not see him actually take the natural fly. With considerable trepidation, I attached a scarlet Mayfly

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to my cast, and offered it to the fish. The sun was shining brightly, and the lure made a hideous display on the water, like a floating fuchsia blossom, and I confess I was surprised when the trout, instead of darting away at its approach, rose, quietly sucked it in, and was landed.

"So much for a first experiment; but I was not quite satisfied, because I had not observed this trout taking the natural Mayfly. So I went down to a bend in the river where there were three trout rising. The first of these took the red Mayfly greedily, and weighed 1½ lbs. I changed to a bright blue Mayfly, to which the second trout succumbed, and so did the third, each of them weighing 1¼ lbs. Several others followed on the blue, as well as a brace of chub, till, at a place peculiarly favourable for watching the movements of fish, I mounted the red again. It was the hottest time of day, and at first I thought the trout had found me out. One fish came up two or three times, and turned from the red fly; I took it off and tried him with a grey one, which he took. This certainly looked as if the trout perceived a difference between cherry colour and ash colour. But a little later almost the converse happened. A trout came up, inspected, and refused the grey fly, and afterwards took a blue one. The prettiest fish in the bag, a lovely two-pounder, fell to the blue fly, which it took after swallowing several of the natural. To make a long story as short as is consistent with precision, I landed during that afternoon thirty-one trout, of which only one weighed less than a pound. Four or five were hooked on the grey fly, all the rest on reds and blues. My limit being four brace, I exceeded it accidentally by one, and kept nine

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trout, weighing 13½ lbs. I might have landed many more, had I worked harder and continued longer, for I killed a fish on the red with my last cast at 6.30, when there was still an hour and a half of daylight, and trout rising like mad.

"Now, I do not suspect any of my readers of doubting the accuracy of this account, but every scientific experiment is more satisfactory when it is conducted before eye-witnesses and corroborated by them. The gamekeeper was with me on this occasion, and took an intelligent interest in what went on, but I refrain from citing him in evidence, because, in order to do so, I should have to indicate the precise locality where trout are so numerous, which would be a dubious return for the kindness of my host.

"But two days later, on Saturday, June 5, I enjoyed an even better opportunity of testing the abnormally coloured flies, in the presence of three independent witnesses. This was in the Beane, near Hertford, where fish are not nearly so plentiful as in the Gade, and far more wary. That day, it may be remembered, was intensely hot and bright. Unluckily, I had used up or given away all my cherry-coloured Mayflies, and I had only one large and very bright blue one left. The fish began to rise about 2.30, and I had landed two brace, weighing 7½ lbs., with the ordinary Mayfly before 4.30. I mention particulars of size in order to show that these trout had arrived at years of discretion. The stream at this part was excessively weedy, besides being overhung with wood, and it was only possible to fish in a few holes and channels in the weeds. I tried a good fish with the grey fly, which he refused, and I then went up to have a cup of tea at

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a friend's house. Returning at 5.30, I found this fish rising and mounted my solitary blue fly, though I considered it too large for the intensely bright sunshine. He took it immediately and was landed, 2¼ lbs. Not far from the same place another fish had taken up his position, and, on being offered the blue fly, seized it at the first time over, 2½ lbs. Three persons, Mr. Abel Henry Smith, M.P., the Hon. Mrs. Smith, and Mr. Anstruther, saw the fly taken out of the mouths of these fish, and I warned them that I should subpœna them as witnesses.

"The next act in the drama did not end so propitiously. Mr. Anstruther was the sole witness to it besides myself. A large fish was rising in a pool at the foot of an alder. I got the blue fly nicely over him, and he took the first opportunity of hooking himself. Throwing himself out of the water, he showed well over 3 lbs., but, dashing into a dense bed of weeds, he struggled so violently that, in spite of all care, he smashed the gut, and carried off the last of my heretical flies. I stopped operations after landing two other fish (3 lbs. and 1½ lbs.) on the grey fly, making a total of eight fish weighing 16¾ lbs., besides a few others returned under size.

"By the time these lines are in print, the May-fly will be over, so I cannot undertake to repeat the experiment this year in the presence of experts, but if I am spared to see another season I shall hold myself ready to do so. For that matter, anyone may try the experiment for himself, but let me repeat what I have already said about the importance of having the flies tied with modulations of light and dark red, blue, or whatever colour may be chosen. Meanwhile, I forward for the editor's

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inspection the three flies actually used, two reds and a blue, supplied by Mrs. Ogden Smith. I should add that the blue was originally of a deeper hue, some of the dye having washed out. It will be noted that, owing to the transparency of the hackles and wings, the full value of the bright colour is apparent to the human eye when the flies are held with the sky as background. On June 3, the fish took the blue and red flies as readily in the early part of the afternoon, when the sun was bright, as they did later on, when the sky was overcast, with a strongish north-east wind down stream.

"Now, I am as far as possible from desiring to bolster up an *a priori* theory of the colour-blindness of fish. I am anxious that my statements should be closely criticised and the conclusions from them verified by the experience of other anglers. To many of these it may occur to ask, why was the experiment tried only at the Mayfly season, when trout lose their senses? To this I reply that my original statement had no special reference to trout, but it had special reference to salmon. But as salmon are vagrant, uncertain creatures, here to-day and gone to-morrow, it is impossible to experiment on them with the precision which can be applied to trout in a clear English stream, where every movement can be watched. I selected the Mayfly as a test because, when it is on, not only is every trout on the move, but the daily rise is usually much more prolonged than at other times. The next step must be to display scarlet, purple and blue quills, or dark crimson alders. Some scarlet and blue quills I had tied last year for use in the Itchen, but it was such a notoriously bad rising

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season that I did not persevere with them, and the results were negative. The scarlet quills did not frighten the trout, neither did they attract them.[1]

"Next, it may be asked, what is the general impression left on my mind by these experiments, so far as they have gone? What light have they thrown on the problem of the perception of colour by fish? The fair inference seems to be this alternative—either fish do not perceive the difference between the coloured rays reflected from or transmitted through objects, or, if they perceive them, they disregard them. If the first alternative be accepted, then nothing is upset except the hypothetical belief in the colour sense of fish. If the second be preferred, then we come face to face with this difficulty, that the extraordinary acuteness of vision possessed by an educated trout is directed wholly to the shape, size, and degree of light or dark in its prey, and not at all to its colour. For my own part, after carefully studying the behaviour of these trout in two different rivers, I would not hesitate to put a scarlet or a blue fly, correctly shaded to correspond with the markings in the natural insect, over a five-pounder taking the natural insect, with as much confidence as I should display a brown or a grey one. I do not pretend that there is the slightest advantage in doing so, save the trifling one that the angler is enabled to detect with greater ease his own fly floating down among natural ones on the surface.

"But if these conclusions be just with respect to

[1] There is great difficulty in getting small trout flies for dry work satisfactorily tied with dyed feathers. The dye seems to ruin the texture of such feathers as the starling wing; but no doubt this difficulty may be overcome in time.

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trout, the wariest fish that swims, what an important bearing it has on the whole theory and practice of salmon-fishing with fly! what a vast degree of ingenuity is exhausted in devising attractive patterns of salmon flies, and what a lot of perplexity and hesitation the angler undergoes at times when salmon are not in a taking mood! The dash and plunge of a rising salmon is very different from the deliberate glare and *sip* of a trout taking the dry fly. The trout gazes earnestly and critically at what is shown to it; if the most unnatural and brilliant colours do not deter him from attack, how much less likely it is that a salmon should refuse a lure because it does not correspond precisely in hue with some imaginary creature which it is supposed to represent.

"Some salmon flies doubtless are more conspicuous in the water than others. Those with strong contrasts of shade, such as Jock Scott, Dandy, or Durham Ranger, may be more easily detected, even by a colour-blind creature, than those of an uniform tone like the Blue Doctor or the Kelly. The glitter of tinsel, also, renders such flies as the Wilkinson or Silver Grey very attractive; but I have long thought it possible, and begin to believe it probable, that even supposing a fish is placed in the best possible position for detecting variety of colour in a fly, instead of, as he must be in nine cases out of ten, in the worst, all the impression he receives is the *chiaro-oscuro* of a vivid photograph."

Now there is nothing new in all this; it is only the careful analysis of phenomena which have led many other observant anglers towards similar conclusions. If any body doubts this, let him read the chapter on salmon-flies (Chapter XI.) in Stoddart's

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Anglers' Companion, of which the second and last edition was printed as long ago as 1853. I select this author as one whom education and a life-long devotion to angling alike entitle to respectful attention. Descended of a race which, for many generations, had owned lands on the watershed between Tweed and Yarrow, Thomas Tod Stoddart, though born in Edinburgh in 1810 and educated there, found his way to the waterside as naturally as any otter's whelp. He was not rich; his means were barely enough to keep him decently fed and clad, without absolute necessity for supplementing them by labour of hand or head; "contented wi' little and canty wi' mair," this "Stout heart" (if one may accept the traditional etymology of the name fondly cherished by the family) turned from the Scottish Bar, for which he was destined by his father, and embraced liberty and letters.

From the moment, indeed, when in 1825, he began to attend College classes in preparation for his future profession, the lad's destiny was sealed. Naturally romantic and with a strong taste for poetry, the fate was irresistible which ruled that Professor John Wilson—the great "Christopher North"—should be young Stoddart's chief instructor, and William Aytoun and John Wilson, the Professor's son, his classmates. His friendship with the latter opened to him the doors of the good Professor's house, and his daughter has told how he came under an influence there which weaned him more and more from the routine and somewhat stern discipline of his own home. For his father, Captain Pringle Stoddart, R.N., seems to have been a bit of a martinet, and sternly discouraged the growing symptoms which his

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son showed of diverging from strict professional study.

"The friends of the house (Professor Wilson's) where he loved to spend his leisure were Aytoun, Terrier, and Gordon, De Quincey, Hartley Coleridge and the Ettrick Shepherd, "Delta," and Henry Glassford Bell—to him the very salt of the earth." [1]

But if Thomas Stoddart's devotion to literature sprang from no hereditary source, it was by his father that the first seeds were sown of the passion for angling. The Water of Leith, once a good salmon stream, was still well stored with trout, and it was there that Thomas learnt the craft of fly-fishing.[2] And thus it came to pass that under the combined influence of his home and his college association, wig and gown almost faded out of the scene where they had been set as goal; so that when, some years later, Sheriff Glassford Bell asked:—

"Well, Tom, and what are you doing now?"

"Doing?" was the reply, "Man, I'm an angler."

This was probably before Stoddart's marriage, which took place in 1837. By that time he had wandered beside many streams and floated over many lochs. He had tramped through a great part of the Highlands, cast his fly in every pool and stream of Tweed and Teviot, and spent some of the immortal *Noctes* at Tibbie Shiel's at St. Mary's Loch with the Professor and the Shepherd.

[1] Angling Songs, by Thomas Tod Stoddart, with a Memoir by Anna M. Stoddart. Edinburgh, Wm. Blackwood and Sons, 1889.

[2] This pretty stream which, until lately, ran foul with every imaginable impurity, so that not so much as a stickleback could live therein, has now been cleaned, and re-stocked with trout. *Euge! bene!*

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Miss Stoddart is frank enough about these gatherings at Tibbie's. She quotes the old landlady's description of them, as given to a visitor shortly before Tibbie's death.

"Eh! but they were the callants for drinkin'! Mony's the time, when they were at it, I've fried a bit ham and took it to them and said, 'Ye'll just tak this bit ham, gentlemen; maybe it'll sober ye; and they wad eat it, and just on to the drinkin' again.'"

Not a very refreshing picture, perhaps, of the habits of Edinburgh gentlemen sixty years ago; but one cannot find perfection, and if the Scottish metropolis was conservative in habits of conviviality, it was also slow to part with its ancient literary culture.

In February 1833 Stoddart was admitted a member of the Faculty of Advocates, his legal career beginning and ending at the same point, for it is not on record that he ever held a brief. He was busy that year on his papers on the *Art of Angling*, afterwards published in *Chambers's Journal*, and subsequently as a separate volume; and he continued to explore the waters of various parts of Scotland.

It was in 1835 that his rambles led him to his fate. Inverness, whence he made his way on foot to Dingwall, and thence up Strathpeffer as far as Contin.

It was a memorable excursion for him, for in its course not only did he kill his first salmon, but the grey eyes of Bessie Macgregor, one of the daughters of the tenant of Contin, settled his fate for life. Thomas and Bessie were married in April 1836 and spent the honeymoon on the Findhorn and the Nairn. Perhaps Stoddart comtemplated settling

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on the Moray Firth, within view and easy reach of the native hills of his Highland bride; and his freedom from any settled profession or duties left him free to do so had he wished it. But a stronger influence called him south—the spell which the Tweed ever casts upon the spirits of her sons—and in June 1837 the young couple came to Kelso. Here they stayed while Stoddart and his friends sought some appointment for him, sinecure or otherwise, to supplement his narrow income. Stoddart himself never "put his back" into the search. He was too happy among the streams of this Border land to be serious in any intention of quitting it, and Kelso remained his home for the rest of his life. Thence he continued to wander far and wide, angling in the waters of almost every part of Scotland, and when there was no fishing, he laid aside his rod and took up the pen.

Such was the man—one with literary gifts sufficient to enable him to record his experience of many waters, and with mental faculties sufficiently disciplined by education to make logical deductions from that experience—whom I venture to cite as superior to careless acquiescence in, and servile conformity with, the inveterate prejudice of local anglers.

When he wrote his *Anglers' Companion*, "Irish innovations," as he termed the bright flies, had established recently a killing reputation on the Tweed. But he remembered the day when they were looked upon with horror.

"I am only, reader," he wrote, "stating a well known fact, when I affirm that, in the time I allude to, the salmon-fishers on Tweedside not only held what is called the Irish fly in absolute ridicule, but actually forbade the use of it on

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those portions of the river which they individually rented; and this they did, not because they deemed it too deadly for every-day use, but solely because they conceived it acted as a kind of bugbear to the fish, scaring them from their accustomed haunts and resting-places. . . . . Was the bye-gone school of anglers a humbug? Is the modern one less so? . . . . Seriously speaking, are the tastes and habits of salmon, as some assert, of a revolving nature? Is the fish, too, so capricious, that a single fibre wanting in the lure, a misplaced wing, a wrongly assorted hue, will discompose and annoy it?"

These inquiries by Stoddart I leave to the modern reader to digest, trusting that if he is at the pains to frame replies to them, the ingredient of common sense may not be omitted. The kind of answer which Stoddart himself suggested may be inferred from the anecdote he supplies of a Scottish laird who renounced all colour and combinations of colour in his flies, and dressed them all in white, with "snow-white dubbing and hackles, silver-twist, and portions of the pencilled wing feather taken from the silver pheasant . . . . and although competed with by one of the ablest craftsmen in the district, whose notions regarding the visual perceptions of fish were perfectly different . . . . managed generally to bear off the palm."

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CHAPTER VI

SALMON FLIES (*continued*)

SOME years ago, during a meeting of the British Association, one of the sections was engaged in a discussion on salmon and the salmon laws. I happened to enter the room when a lady was addressing the audience, and just as she remarked, "The first question we have to ask ourselves is 'what is the natural food of salmon?'" an irreverent person on a back bench called out, "Salmon flies," a suggestion which was very properly received in dignified silence, though some of us felt disposed to titter. Nevertheless, much salmon-fishing is conducted on lines which presuppose that the habitual diet of salmon consists of Durham Rangers or Jock Scotts, or something which these ingenious structures resemble. It is assumed that, because the fish takes the so-called "fly" in his mouth, he intends to eat it; but it is usually forgotten that, having no other prehensile organ, he must either grasp it with his mouth, or let it alone. Now I can only testify what I should do if, seated at this writing table on—shall I confess it?—a Sunday evening, I beheld a strange and

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brilliant creature flitting about my room. Why I should *rise*, and, being furnished with a serviceable pair of hands, should employ them for purposes of capture, or try and knock the intruder down with my hat, though the last idea that would enter my brain would be to eat the unfamiliar object. All this, provided the strange creature were not so big as to cause me alarm, in which case I should either leave the room or ring for the footman. Well, the salmon acts in a precisely similar way. He, too, *rises*, for the purpose of capture, but having neither hands to grasp withal, nor a hat to fling over the stranger, he either snaps at it with his mouth or tries to flap it with his tail, provided the said stranger is not too big to cause him alarm. If it is, having no bell to ring, he simply lies low.

All this is thoroughly consistent with the principles of fly-fishing for salmon, even if it be admitted that flies are exceptional, not habitual, incidents in the salmon's bill of fare. An acquaintance of mine, whose testimony is perfectly trustworthy, told me that he once killed a salmon with a Mayfly, fished dry. It was in the Inver, in Sutherlandshire. The water was very low; of a large number of fish lying in a certain pool, not one would move at the daintiest salmon or grilse flies, and Mr. P—— gave up the attempt to make them do so. Presently he noticed a remarkable thing. A common white butterfly came floating down the stream; a salmon rose quietly and took it. Mr. P——hunted out a Mayfly, attached it to his cast, floated it down over the fish, which rose, was hooked, and landed. In this instance the salmon, having ascertained that the butterfly was palatable, doubtless did take the Mayfly with gustatory intent, but it is surely

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too much to assume that all the lures we display are seized from similar motives.

Nine anglers out of ten perhaps would be content to dispense with inquiry into the exact motives which impel a salmon to take the fly, were it not that an understanding of these motives may facilitate the accomplishment of that most desirable action on the part of the fish.

If the opinions expressed in the last chapter are well-founded, namely, that salmon behold all the many-coloured lures, displayed for their attraction, in one uniform hue of varied shades, just as a colour-blind person sees a landscape or a group of figures, or as a photograph or engraving appears to a person of normal vision, it follows that half-a-dozen patterns, used in different sizes, would ensure as much success as the prodigious variety which usually encumbers the fisherman and perplexes his judgment. Admitting that salmon possess vision of extraordinary quickness and power, and that they perceive the gradations and contrast of light and shade, however much such perception must be modified as regards an object passing between the eye of a salmon and the light, perhaps the utmost that can be attained by the most skilful fly-dresser is the barred or mottled effect, with metallic glitter, which is so common in diminutive aquatic organisms. Nevertheless, the belief in the attraction of fish by combinations agreeable to the eye of the fishes is so ancient and deep-rooted that the day has not yet dawned when one, undertaking to write on the mysteries of the craft, may presume to pass over in silence the salmon flies of most established repute. The theory and practice of fly dressing which has endured for

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centuries is not to be dismissed with levity. Richard Franck, writing 250 years ago, condemned the revered Izaak Walton for "stuffing his indigested octavo" with the observations of other men, and denounced him as "a plagiary (poor man) for his loss of time in scribbling and transcribing other men's notions."[1] Franck was a keen and successful angler, albeit he had to quiet his Puritanical qualms about taking life in sport by quoting the command, "Arise, Peter, kill and eat." He was also a critical observer of nature, for, although he gave credit to the folklore that attributed the origin of bernicle geese to shell-fish, he bitterly derided Walton's assent to the notion that pike were bred from pickerel weed, and preferred the more rational explanation of pike appearing in isolated waters which attributed to aquatic birds the agency of transporting fertilised ova. Yet was the austere Richard just as dogmatic in his prescription for the composition of a salmon fly as any Tweed boatman of the present day

"Remember," he says, "always to carry your dubbing-bag about with you; wherein there ought to be silk of all sorts, threads, thrums, moccado-ends and cruels of all sizes, and variety of colours; diversified and stained wool, with dog's and bear's hair; besides twisted fine threads of gold and silver: with feathers from the capon, partridg, peacock, pheasant, mallard, smith, teal, snite, parrot, heronshaw, paraketta, bittern, hobby, phlimingo or Indian-flush; but the mockaw, without exception, gives flames of life to the hackle. . . . . Should any man, under the pretence of an artist, remain destitute of these prenoted qualifications, proclaim him a blockhead; let him angle for oisters."

[1] Northern Memoirs (ed. 1821), p. 175.

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It is to be noted that this authoritative teacher arrived at a different conclusion to that of most modern *doctrinaires* about the weather most suitable for bright or sober flies. The most prevalent formula nowadays prescribes dull flies for a dull day and bright flies for a dark one. Franck, on the contrary, insists on the advantage of brilliant hues to "quicken the sight of your game, provided the day be promiscuous and dark, occasioned by smooty and discoloured clouds."

If the weather changes during a day's fishing—

"You must then clap down beneath some rock, or you may shelter yourself in the cavities of the earth: so with curious inspection and diligent observation, the brightness or gloominess of the day considered, fashion your device according to your art; considering the general cure for proportion, as also the season, by the rule of contraries. For the brighter the day is, the obscurer your fly; but the more promiscuous the season is, by so much more ought your fly to be bright and shining. . . . . But if novelties affect, as frequently they do, you must then consult your flies to excel one another, if provided you design to advance your recreation."

Should it ever come to pass that these venerable precepts are set aside as empirical and undemonstrable, and men come to the cold conclusion that the colour of a salmon fly is of little or no moment, but that much depends on its size, life-like shape and motion, and on the shades of light and dark displayed on it, then another doctrine will join many others in the limbo of fallacy and fond superstition.

One of these empirical doctrines, which was a favourite one with Franck, has found its way there long ago, though at one time the angler who should dare to question its efficacy would have incurred

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the charge of obstinate heresy as surely as I have done in the matter of flies, and been bidden to go and "angle for oisters." It was firmly believed that aromatic or strongly scented oils exercised a powerful attraction on fish, and Franck endorses the belief by counselling the angler "when designing to approach the deeps for diversion, that he take some (oil) always with him to heighten his exercise, or influence and inamour his game. It is not difficult to put some (worms) in a box made of wood called *lignum vitæ*, perforated with holes, besmearing or anointing it over first with the chymical oil of bays, sulphur, Barbadoes tar, ivy, *cornu-cervi;* or indeed almost any other oil that has but a strong and fœtid empyruma will serve well enough, where the oil of oesprey is generally wanting." We smile indulgently at the assumption that these odours possess any attraction for fish, to which they must come as a complete novelty. The bottom fisher has dismissed such prescriptions from his practice, though no doubt fish will take worms and other bait in spite of the artificial smells imparted to them. Some day, perhaps, the opinion will prevail that the delicate and brilliant hues recommended for the composition of a salmon fly are, not objectionable, indeed, nor inimical to sport, but superfluous. That day, however, probably is a distant one, and the rest of this chapter shall be devoted to a description of and directions for tying some of the flies most in favour at the present time in Great Britain and Ireland. However much one may agree with the sentiment of an old friend of mine, with longer and more successful experience of salmon-fishing than most others, that "flies are tied to please men, not fish,"

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to face p 148.

1. THE WORMALD

2. THE MAR LODGE

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it must be admitted that there is a great fascination in the preparation and choice of these hypothetical structures which we choose to call "flies," and that one may as well fish with a beautiful work of art as with a tasteless agglomeration of feathers and wool. Even the philosophical Stoddart, all his professed indifference to variety notwithstanding, supplied his readers with numerous recipes for preparing flies suitable for different rivers (Plate II. Figs. *a*, *b* and *c*). Far be it from me to neglect such an admirable example. In the following list (if not of the fifty best flies, at all events—of fifty flies which have been proved deadly to salmon) I have endeavoured to include the most typical varieties; and any ambitious amateur may vary the hues and materials without in the slightest degree impairing the efficacy of the lures. Mr. Kelson has put on record innumerable varieties, and his lists will be found very interesting to the fanciful fly-dresser.[1]

CLASS A.—TINSEL-BODIED FLIES.

Name of Fly.	*Composition.*	*Remarks.*
1 THE WILKINSON.	*Tag*—Silver wire and yellow floss. *Tail*—A topping (golden pheasant crest feather) and a short tippet feather (from the tippet or ruff of the same bird). *Butt*—Scarlet wool. *Body*—Silver tinsel (laid on foundation of floss silk), ribbed over with silver twist.	A fly of recent, but well-founded, fame. May be used of all sizes. Some Edinburgh dressers put a blue hackle over the crimson gorget, but this is the reverse of an improvement.

[1] *Salmon Flies, How to Dress them and How to use them*, by G. M. Kelson.

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Name of Fly.	*Composition.*	*Remarks.*
1 THE WILKINSON (*continued*).	*Hackle*—Crimson dyed cock's, laid on full only at the shoulder. *Wing*—A pair of jungle cock feathers as long as the body. Mixed wing over, composed of brown and grey turkey, brown mallard, gold pheasant tail; strips of red, blue and yellow dyed swan; blue chatterer cheeks; topping over all. *Head*—Black chenille.	
2 THE SILVER DOCTOR.	*Tag*—As in No. 1. *Tail*—A topping and Indian crow. *Body*—As in No. 1, but with a sky-blue hackle carried along the twist. *Shoulder hackle*—Blue jay. *Wing*—Mixed, with gold pheasant tail, grey turkey and pintail predominating; topping over. *Head*—Scarlet wool.	A standard pattern on Tweed and elsewhere, but sharing the defect of all flies in which hackle is laid over the tinsel, that the teeth of the fish play the mischief with it. Sizes from 18 down to 5.
3 THE HELMSDALE DOCTOR.	The same in all respects as No. 2, save that there is no body hackle, and the shoulder hackle is bright yellow.	Better than No. 2 in respect that it has no body hackle to be cut.
4 THE SILVER GREY.	*Tag*—Silver wire and lemon floss. *Tail*—A topping with strips of wood duck (unbarred) and blue fibres. *Butt*—Black chenille. *Body*—As in No. 1, but with a black centred grey cock's hackle car-	A lovely counterfeit of a full-dress shrimp. Disputes the palm with No. 1. The whole tone of the Silver Grey should be kept in harmony with its name. Sizes from 18 to 5.

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Name of Fly.	*Composition.*	*Remarks.*
4 THE SILVER GREY (*continued*).	ried down beside the twist. *Shoulder hackle*—Teal or pintail. *Wing*—Two short jungle fowl feathers; fibres of tippet, grey turkey, gold pheasant tail, wood duck and blue-dyed swan; topping over. Blue macaw horns. *Head*—Black chenille.	
5 THE DUSTY MILLER.	*Tag*—Silver wire and olive floss. *Tail*—A topping. *Butt*—Black chenille. *Body*—Embossed silver tinsel, with gold thread and dark olive over; gallina hackle at shoulder. *Wing*—Mixed, of gold pheasant tail, mallard, teal, green parrot and lavender swan; short jungle cock at cheeks; topping over; blue macaw horns. *Head*—Black chenille.	Chiefly useful in small sizes.
6 THE MAR LODGE. (Plate II. Fig. 2.)	*Tag* — Silver wire or twist. *Tail*—A topping and short jungle fowl. *Butt*—Black chenille. *Body*—One third silver tinsel, one third black floss, and another third silver tinsel; flat silver twist over. *Hackle*—Guinea fowl—full—at shoulder, the large black and white mottled feather, not the grey one. *Wing*—Slices of brown turkey, gold pheasant	A very tasteful fly of modern repute on the Aberdeenshire Dee. Best in large sizes.

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Name of Fly.	*Composition.*	*Remarks.*
6 THE MAR LODGE (*continued*).	tail rather shorter over, and liberal slices of wood-duck over that. Jungle fowl cheeks; topping over; blue macaw horns. *Head*—Black varnish.	
7. THE SILVER SECRETARY.	*Tag*—Gold wire. *Tail*—A topping or two and a tuft of scarlet ibis or dyed swan. *Body* — Silver tinsel, thick silver twist over. *Hackle* — Navy blue cock's down the body, gallina at shoulder. *Wing*—Two long jungle cock feathers, doubled with two shorter ones. Slips of turkey with brown butt, black bar and white tip, bright bustard and fibres of scarlet, green and lavender swan; topping over; blue macaw horns. *Head*—Black chenille.	This fly is given a place in this limited selection out of gratitude for its having one day landed seven salmon in quick succession from the North Tyne in 1867, when gaudy flies were regarded as devices of the Evil One in that river. It was probably the first silver-bodied fly that ever swam in that river. The Silver Secretary should be used of large sizes, 18 to 15.
8 THE DANDY. (Plate IV. Fig. 5.)	*Tag*—Silver wire and citron floss. *Tail*—A topping and Indian crow. *Butt*—Black chenille. *Body*—Lower half, silver tinsel; upper half, sky-blue floss. Silver twist over. *Hackle*—Sky-blue cock's over the floss, gallina at shoulder. *Wing*—A pair of long jungle fowl, over them a pair of tippet feathers, not so long, and the tops of a pair of barred wood duck feathers, still shorter,	My favourite fly in all this class. It was named after the late Lord Alexander Paget. It is an expensive fly to dress, but it is extremely pretty, and very effective in the sizes from 16 to 12.

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Name of Fly.	*Composition.*	*Remarks.*
8 THE DANDY (*continued*).	over the last; blue chatterer cheeks; topping over all; blue macaw horns. *Head*—Black chenille.	
9 THE BERYL.	*Tag*—Silver wire and lemon floss. *Tail*—A topping with sprigs of grey pintail, scarlet ibis and a blue chatterer feather. *Butt*—Black chenille. *Body*—Silver tinsel, ribbed with silver twist. *Hackle*—Rich orange cock's at shoulder, grey pintail over. *Wing*—Two long jungle fowl, a lump of golden pheasant's tail, strips of scarlet and blue dyed swan, and slices of grey pintail. Blue chatterer cheeks, topping over. *Head*—Black chenille.	A modern Tweedside pattern, with which I have killed a lot of fish. Sizes, 18 to 11.
10 THE SIR HERBERT.	*Tag* and *Body*—All one, of gold tinsel, ribbed with gold twist. *Tail*—Topping and Indian crow. *Hackle*—Dyed golden cock's down the body. One-fourth of the body next the shoulder is of scarlet mohair, picked out, over which a crimson cock's hackle for shoulder. *Wing*—Two tippet feathers, rather long, a pair of shorter jungle fowl over with strips of gold pheasant tail and white and scarlet dyed swan, and a good	The only gold-bodied fly of which I have experience. A good killer anywhere, and in all sizes, but troublesome from having a body hackle. The crimson shoulder hackle over scarlet mohair gives the insect an exceedingly rich appearance. Sizes, 18 to 5.

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Name of Fly.	*Composition.*	*Remarks.*
10 THE SIR HERBERT (*continued*).	slice of wood-duck. A few fibres of emerald peacock's herl; topping over, blue chatterer cheeks, red macaw horns. *Head*—Black or green chenille.	
11 THE SNOW FLY.	*Tag*—Silver tinsel. *Tail*—A topping, slips of wood duck, tuft of scarlet ibis. *Butt*—Black chenille. *Body*—In four joints, each made of stout silver twist flattened. At every joint a tuft of pig's wool is tied in and picked out in a ruff; at the first joint, nearest the tail, bright blue wool; second, crimson; third, orange; fourth, at the shoulder, yellow. *Hackle*—At the shoulder, orange. *Wing*—Mixed, composed of any fibres long enough for a large fly, with slips of yellow, pink and green dyed swan. *Head*—Black chenille.	This is the river Garry Snow Fly; and where a large brilliant fly is required for early fishing it has no equal, because there are no hackles to be cut by kelts, and the body is composed of indestructible material. The colours of the wool may be varied according to the whim of the dresser. Sizes, 20 to 17.
CLASS B.—SILK-BODIED FLIES.		
12 THE JOCK SCOTT. (Plate IV. Fig. 2.)	*Tag*—Silver wire and golden floss. *Tail*—A topping and Indian crow. *Body*—Lower half, golden floss ribbed with silver twist. Above this are tied as in a joint some rich orange feathers from the throat	Perhaps no fly has earned such a world-wide reputation as this one. Designed in 1845 by Jock Scott, fisherman to Lord John Scott, it has continued in high favour ever since, and has be-

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Name of Fly.	*Composition.*	*Remarks.*
12 THE JOCK SCOTT (*continued*).	of the touean. Upper half, black floss ribbed with silver tinsel. *Hackle*—Black cock's over the black floss, gallina at shoulder. *Wing*—Two heavy slices of bronze turkey with clear white tips, mixed fibres over of bustard, mallard, pintail, and scarlet, blue and yellow dyed swan, and green peacock herl. Jungle cock at cheeks, half the length of wing; blue chatterer over all. *Head*—Black chenille.	come the progenitor of a host of variations—Blue Jocks, Purple Jocks, Claret Jocks, and Silver Jocks. In the Silver Jock the gold floss of the original is exchanged for silver tinsel: in the others, silk of various colours replaces the black floss; but none of them equal their parent in attractive harmony and effective contrast. Sizes, 18 to 5. (*See* Fig. 38.)
13 THE SIR RICHARD. (Plate IV. Fig. 1.)	*Tag* and *Tail*—As in No. 11. *Butt*—Black chenille. *Body*—Black floss ribbed with broad silver tinsel and silver twist side by side. *Hackle*—Gallina, extending over the upper third of the body, blue jay at shoulder. *Wing*—Mixed bustard and brown mallard, with strips of green, red and yellow dyed swan, blue chatterer cheeks; topping over; blue macaw horns. *Head*—Black chenille.	A fly which has risen into high favour of recent years. "And why wouldn't it? Sure, it's a fine killer." Sizes, 16 to 8.
14 THE BLUE DOCTOR.	The same as No. 2, but substituting sky blue silk for the tinsel body.	It is said this fly will not kill in North Tyne. I would gladly take my chance there with it. Sizes same as No. 2.

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Name of Fly.	*Composition.*	*Remarks.*
15 THE BLACK DOCTOR.	The same as Nos. 2 and 13, substituting black floss and black hackles for silver and blue.	
16 THE POPHAM.	*Tag*—Gold wire. *Tail*—A topping and Indian crow. *Butt*—Emerald green chenille. *Body*—In three joints of yellow, blue and orange floss respectively ribbed with thin gold twist. At each joint are tied in a few of the scarlet throat feathers of the Indian crow, arranged like the toucan feathers in Jock Scott, with a turn of green chenille over each knot of feathers. *Hackle*—Blue jay at shoulder (Indian roller in large flies). *Wing*—Mixed fibres of gold pheasant tail and tippet, bustard, teal, slips of yellow and crimson swan. Topping over. *Head*—Green chenille.	This is an elegant creature, and kills as well as any other, but it is an example of the wasted ingenuity of the fly dressers. The silk joints are overlaid and concealed by the Indian crow feathers tied in.
17 THE GREENWELL.	*Tag*—Silver wire and lemon floss. *Tail*—A topping and small jungle fowl. *Butt*—Black chenille. *Body*—Very pale blue floss, ribbed with silver tinsel and twist. *Hackle*—Pale blue cock's over the body, pintail at shoulder *Wing* and *Head*—As in Jock Scott, but without the chatterer cheeks.	The effect of a Greenwell in the water must be very similar to that of a Silver Grey, though with less glitter. It is a warm favourite with many anglers, and has been the death of several very heavy fish. Sizes, same as No. 4.

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Name of Fly.	*Composition.*	*Remarks.*
18 THE BLACK AND TEAL.	*Tag*—Silver wire and gold floss. *Tail*—A topping. *Butt*—Black chenille. *Body*—One-third orange floss, the rest black floss (or seal's fur in larger flies), ribbed with broad silver tinsel. *Hackle*—Black cock's over black floss, gallina (the large spotted feather) at shoulder. *Wing*—Two long and two shorter jungle fowl, teal or pintail (two whole feathers), topping over. *Head*—Gold twist.	A good stand-by in all weathers. In small sizes, two jungle fowl may be substituted for four, and slices of teal used instead of the whole feather. Sizes, 17 to 5.
19 THE BLACK DOG.	*Tag*—Silver tinsel. *Tail*—A topping or tuft of orange mohair. *Butt*—Black chenille. *Body*—Black floss, ribbed with ruby floss, on one side of which is broad silver tinsel, on the other gold twist. *Hackle*—Black cock's over the body, at shoulder a long-fibred heron hackle dyed crimson. *Wing*—Two tippets, then mixed gold pheasant tail, bustard, strips of crimson, yellow and orange dyed swan, peacock herl, a slice of wood-duck, large topping over, red macaw horns. *Head*—Black chenille.	This is the modern version of a very old Tay pattern. Black used to be the prevailing tone, but gay colours have been added to keep it abreast of the fashion. It is used as a large spring pattern, 20 to 17.
20 THE LORD JAMES MURRAY.	*Tag*—Silver wire and gold floss. *Tail*—A topping and blue chatterer feather.	A gaudier creature than the Sir Richard, which it resembles in some

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Name of Fly.	*Composition.*	*Remarks.*
20 THE LORD JAMES MURRAY (*continued*).	*Butt*—Black chenille. *Body*—Black floss, ribbed with silver tinsel and twist. *Hackle*—Black cock's over body, rich orange at shoulder. *Wing*—Two long jungle fowl, and two tippets, rather shorter. Over these slices from the scapular feathers of the farmyard drake (which is brighter than brown mallard), strips of gallina, blue chatterer cheeks, and a good topping over. Blue macaw horns. *Head*—Black chenille.	respects. It is a fine fly in large sizes.
21 THE MYSTERY.	*Tag*—Silver wire and gold floss. *Tail*—A topping and Indian crow. *Butt*—Black chenille. *Body*—Salmon coloured floss, ribbed with broad silver tinsel (and gold thread, in the larger sizes). *Hackle*—Dun cuckoo or mottled Scots Grey cock over body, rich claret at shoulder. *Wing*—Two large slices of bright yellow macaw or dyed swan, blue chatterer cheeks, red macaw horns. *Head*—Black chenille.	This is far from being a pleasing fly to my taste, but it is included in this list owing to the extraordinary reputation it bore some years ago in the salmon rivers of Hampshire. The pattern originally came from the Suir, and in this country the body hackle is usually omitted. Sizes, 14 to 7.
22 THE OWENMORE.	*Tag*—Silver tinsel. *Tail*—A topping and short jungle cock. *Butt*—Violet chenille. *Body*—In four or five joints of black floss, with two turns of flat	This is one of a type of maned flies by which great store is set in the rivers of the west of Ireland. There is hardly any limit to

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Name of Fly.	*Composition.*	*Remarks.*
22 THE OWEN-MORE (*continued*).	silver twist round the top of each. At each joint is tied in a red Indian crow feather, increasing in size towards the shoulder, and on the top of each Indian crow a lock of mohair to form the mane, violet, orange, dark red and yellow in succession. *Hackle*—A red rump feather of golden pheasant, with blue jay over. *Wing*—Tippet fibres, golden pheasant tail and brown mallard; topping over, blue macaw horns. *Head*—Black chenille.	the variations that may be introduced. Sizes, 16 to 7.
23 THE ORANGE AND GROUSE.	*Tag*—Silver tinsel. *Tail*—A topping and blue chatterer. *Butt*—Black ostrich herl. *Body*—One-fourth lake floss; remainder, orange floss, ribbed with silver tinsel. *Hackle*—A feather from the back of a hen grouse, trimmed below and left long on the back of the fly; blue jay at shoulder. *Wing*—Composed entirely of topping, blue macaw ribs. *Head*—Black ostrich herl.	A noted Irish pattern from the Moy, generally tied on smallish hooks.
24 THE THUNDER AND LIGHTNING.	*Tag*—Gold tinsel. *Tail*—A topping. *Butt*—Violet chenille. *Body*—One-fifth orange, remainder black floss, ribbed with gold tinsel.	This fly is in high favour on the North Tyne.

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Name of Fly.	*Composition.*	*Remarks.*
24 THE THUNDER AND LIGHTNING (*continued*).	*Hackle*—Rich orange dyed cock's over body, blue jay at shoulder. *Wing*—Brown mallard, short jungle fowl at cheeks, topping over, blue macaw horns. *Head*—Violet chenille.	
25 THE RORY. (Plate III. Fig. 2.)	*Tag*—Silver wire and orange floss. *Tail*—A tuft of orange mohair. *Butt*—Black chenille. *Body*—In three joints, all of bright yellow floss, ribbed with stout silver twist flattened. At the two lower joints tufts of yellow mohair are tied in like a hackle and picked out, with a butt of black chenille over each. At the third joint, next the shoulder, orange mohair in the same way, with scarlet dyed cock's hackle over. *Wing*—Two long jungle fowl, doubled with two shorter ones. Strips of any feather long enough, with green and scarlet dyed swan; blue chatterer cheeks, large topping over. *Head*—Black chenille.	I have named this excellent fly after Rory of Westerdale, a noted artist on the Thurso. It is used there with effect in the largest spring sizes, and is an excellent, durable pattern.
26 THE BULLDOG.	*Tag*—Gold tinsel and ruby floss. *Tail*—A topping and chatterer. *Butt*—Black chenille. *Body*—Half flat silver twist with Indian crow	A fly with an extraordinary reputation on the Cumberland Eden, but an inartistic conception at best. To be used in large sizes.

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1. THE EAGLE

2. THE RORY

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Name of Fly.	*Composition.*	*Remarks.*
26 THE BULL-DOG (*continued*).	feathers tied in Jock Scott-wise, a turn of black chenille over their butts; upper half French blue floss, silver twist over. *Hackle*—Blue cock's over blue floss, pintail at shoulder. *Wing*—A number of strips of yellow and black dyed swan, barnyard drake over, with jungle fowl; blue chatterer cheeks. Topping over all. *Head*—Black varnish.	

CLASS C.—FLIES WITH BODIES OF FUR OR WOOL.

27 THE WORMALD. (Plate II. Fig. 1.)	*Tag*—Gold wire and orange floss. *Tail*—A tuft of orange mohair. *Butt*—Black chenille. *Body*—One-fourth gold floss, the rest, golden mohair passing through orange into scarlet, picked out roughly. Broad silver tinsel and twist. *Hackle*—Orange dyed cock over the body. Blue dyed cock shoulder hackle, tied in front of the wing. *Wing*—Doubled jungle cock, slices of grey turkey and bustard over with strips of red, green, and yellow dyed swan. Blue chatterer cheeks, and topping over all. *Head*—Black varnish.	This fly is used in the largest sizes for early spring work—the hook is sometimes four inches long. The pattern is a great favourite on the Thurso. It should be tied on a long shanked Dee hook.

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Name of Fly.	*Composition.*	*Remarks.*
28 THE HELL FIRE.	*Tag*—Silver wire and yellow floss. *Tail*—A tuft of orange mohair. *Butt*—Green chenille. *Body*—One-eighth scarlet mohair, four-eighths lemon mohair, one-eighth orange mohair, finishing with two-eighths scarlet mohair under the wing, all picked out shaggy. Ribbed with broad silver tinsel and twist. *Hackle*—Scarlet dyed cock's hackle at shoulder under the wing, yellow hackle over the wing. *Wing*—Orange, blue and yellow dyed cock's hackles, with two undyed from the mottled Scots Grey fowl, fibres of green peacock herl, two toppings over, blue chatterer cheeks.	This flame-coloured prodigy also is used in the largest sizes.
29 THE GOLDSMITH.	*Tag*—Silver wire and gold floss. *Tail*—A tuft of orange mohair. *Butt*—Black chenille. *Body*—One-third flat silver twist, remainder half bright yellow, half scarlet mohair, picked out, ribbed with broad silver tinsel. *Hackle*—Scarlet hackle at shoulder under wing, yellow hackle over wing. *Wing*—Two long jungle cock's, slices of white tipped bronze or black turkey, strips of brown	A Thurso pattern, also used in the largest sizes, but is very effective down to 12.

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Name of Fly.	*Composition.*	*Remarks.*
29 THE GOLD-SMITH (*continued*).	turkey, bustard, and scarlet dyed swan, two long yellow dyed cock's hackles, fibres of peacock's herl, and two toppings over. *Head*—Black varnish.	
30 THE YELLOW EAGLE. (Plate III. Fig. 1.)	*Tag*—Silver tinsel. *Tail*—A topping and tippet sprigs. *Body*—Scarlet, yellow, claret, and blue pig's wool, in equal divisions, ribbed with broadest silver tinsel. *Hackle*—The fluffy thigh feather of an eagle, dyed yellow, extending half way down the body; pintail hackle at shoulder. *Wing*—Two strips of bustard, florican, or any other feather long enough. *Head*—Very small, black varnish.	The eagles are a peculiar race of flies, and the dressing is varied in many ways. They all derive their chief characteristic from the peculiar long fibred feather from the eagle, dressed as a hackle. They are very taking early in the season when large flies are in request.
31 THE WHITE EAGLE.	Dressed as No. 21, except that the body is in three equal divisions, yellow, green and yellow pig's wool, the eagle hackle undyed, of a silvery tone, and the wings long strips of grey turkey with black bars.	
32 THE TARTAN.	*Tag*—Gold tinsel. *Tail*—A red rump feather of golden pheasant. *Body*—Thin, half orange, half scarlet pig's wool, broad gold tinsel. *Hackle*—Red cock's undyed over lower two-	This is the Dee Tartan (the Tay boasts one of its own). It may be taken as the type of the old-fashioned Dee fly dressed on a very long shanked hook. There are

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Name of Fly.	*Composition.*	*Remarks.*
32 THE TARTAN (*continued*).	thirds of body. Above that a long-fibred blue-grey heron's rump feather, leaving a full mass at shoulder. Over all a pintail or teal hackle, tied above the wing. *Wing*—Two long strips of silver-grey turkey. *Head*—Small and varnished.	endless modifications of them, the long heron hackles, both black and grey, being a conspicuous feature, and they used to be invariably finished off with a teal or pintail hackle at the shoulder. It is difficult to get feathers long enough in the fibre to wing these long hooks, and it was an ancient practice to tie in a second pair of wings half way down the body. Flies so dressed swim very nicely.
33 THE YELLOW WASP.	*Tag*—Silver tinsel. *Tail*—A topping, and fibres of tippet feather, scarlet ibis and green peacock. *Butt*—Emerald green chenille. *Body*—Lower half yellow, upper half bright blue pig's wool; gold tinsel over yellow, silver over blue. *Hackle*—Blue dyed cock's over blue wool, black cock's at shoulder, with blue jay over. *Wing*—Dun turkey with white tip. *Head*—Small and varnished.	Once considered indispensable on the Tay, but has yielded place to brighter novelties. Sizes, 20 to 14.
34 THE KATE.	*Tag*—Silver wire and lemon floss. *Tail*—A topping and blue chatterer. *Butt*—Black chenille.	This sweet fly came into early use on the Tweed, the pioneer of vivid colours. It holds its

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Name of Fly.	*Composition.*	*Remarks.*
34 THE KATE (*continued*).	*Body*—One-fourth ruby floss, remainder ruby mohair, ribbed with silver tinsel and twist. *Hackle*—Ruby dyed cock's over the wool, rich yellow dyed cock's at shoulder. *Wing*—Mixed strips of tippet fibres, gold pheasant tail, bustard, brown mallard, and red and yellow dyed swan. Short jungle cock at cheeks, topping over all, blue macaw horns. *Head*—Black chenille.	own well, though there is now a local prejudice against it; but there is no better lure in any water. Sizes, 14 to 5.
35 THE BUTCHER.	*Tag*—Silver wire, yellow floss. *Tail*—A topping, with fibres of teal and blue macaw. *Butt*—Black chenille. *Body*—In four divisions of pig's wool, dark claret, dark blue, scarlet and light blue, ribbed with silver tinsel and twist. *Hackle* — Claret dyed cock's over the wool; yellow dyed cock's at shoulder, with gallina over. *Wing*—A tippet and scarlet sword feather from the root of a golden pheasant's tail. Strips of brown mallard, peacock's mottled feather, golden pheasant tail, with fibres of white and blue and yellow dyed swan; blue chatterer cheeks, blue macaw horns. *Head*—Black chenille.	A venerable pattern with nothing to recommend it except its antiquity and killing properties, for it is a tiresome fly to dress and an ugly beast to look at. Sizes, 18 to 7.

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Name of Fly.	*Composition.*	*Remarks.*
36 THE POYNDER.	*Tag*—Silver wire and sky blue floss. *Tail*—A topping and blue chatterer; no butt. *Body*—One-fifth golden floss, remainder orange scarlet, claret, and darkish blue pig's wool blending into each other, ribbed with flat silver twist. *Hackle*—Claret dyed cock's over the wool, dyed blue cock's at shoulder with gallina over. *Wing*—Mixed, of tippet fibres, farmyard drake, golden pheasant tail, bustard, and strips of scarlet and blue dyed swan. Jungle fowl outside and about half the length of the wing; topping over; blue macaw horns. *Head*—Black chenille.	A very popular fly, and good in all sizes from the largest to the smallest. I am acquainted with one most successful angler who never uses any other pattern but this and the Childers.
37 THE CHILDERS.	*Tag*—Gold twist and yellow floss. *Tail*—A topping, strips of tippet and teal. *Body*—One-half yellow, one-quarter orange, and one-quarter crimson pig's wool, ribbed with gold tinsel. *Hackle*—Claret dyed cock's over body, teal at shoulder. *Wing* and *Head*—As in No. 12, without the jungle fowl.	Not a favourite of mine, but guilty of thousands of murders. Sizes, 18 to 9.
38 THE SIR FRANCIS SYKES.	*Tag*—Silver wire and bright blue floss. *Tail*—A topping, with fibres of teal and a blue chatterer.	Not a common fly, but an uncommonly attractive one in all sizes, down to smallest grilse

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Name of Fly.	*Composition.*	*Remarks.*
38 THE SIR FRANCIS SYKES (*continued*).	*Body*—Cinnamon mohair, ribbed with flat silver twist. *Hackle*—Golden brown cock's over body and at shoulder. *Wing*—Fibres of tippet, strips of gold pheasant tail, bustard, yellow, blue, green and scarlet dyed swan; slices of wood-duck over. *Head*—Scarlet worsted.	hooks. In large flies the tippet may be introduced whole.
39 THE DURHAM RANGER. (Plate IV. Fig. 6.)	*Tag*—Silver wire and gold floss. *Tail*—A topping. *Butt*—Black chenille. *Body*—One-fifth orange floss, followed by orange, claret, and black pig's wool, picked out, ribbed with silver tinsel. *Hackle*—Over the wool a cock-y-bon-du cock's hackle dyed orange, black hackle at shoulder, and sky blue hackle over it. *Wing*—Two long jungle cock, two tippets not quite so long, followed by two shorter tippets. Blue chatterer cheeks, topping over, blue macaw horns. *Head*—Black chenille.	The "Range. wing" is a recognised peculiarity of a class of flies known as the Rangers. The bodies are varied: in the Black Ranger it is all black wool; in the Silver Ranger it is of silver tinsel, and so on. The Ranger originated with Mr. Forrest of Kelso. Sizes, 18 to 8.
40 THE TOPPY.	*Tag*—Silver wire and ruby floss. *Tail*—A tuft of orange mohair. *Butt*—Three or four turns of scarlet dyed cock's hackle. *Body*—Black mohair, ribbed with narrow silver tinsel.	An ancient Tweed pattern, commendably simple. Sizes, 17 to 10.

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Name of Fly.	*Composition.*	*Remarks.*
40 THE TOPPY (*continued*)	*Hackle*—Black cock's over the wool and at shoulder. *Wing*—Two strips of dark bronze turkey tipped with clear white. *Head*—Scarlet mohair, picked out in a ruff.	
41 THE POLICEMAN.	*Tag*—Silver wire and ruby floss. *Tail*—A topping. *Butt*—Black chenille. *Body*—Medium blue pig's wool, pick out rough. *Hackle*—A grey cock's with black centre at shoulder. *Wing*—As in No. 2.	Of this fly Mr. Francis Francis is godfather, for, said he, "its uniform is blue and silver, and its business is making prisoners." And so I have found it. Sizes, 15 to 10.
42 THE BRITANNIA.	*Tag*—Gold tinsel. *Tail*—A topping, sprigs of florican and a tuft of scarlet ibis. *Body*—One-fifth golden floss, remainder orange pig's wool or mohair, ribbed with gold tinsel and silver twist. *Hackle*—Red dyed cock's over the wool; wood-duck hackle at shoulder, with blue dyed cock's hackle over. *Wing*—Two of the ruddy mottled feathers from the flank of a shoveller drake, several toppings over (according to size of fly); jungle fowl half the length of wing, blue chatterer cheeks, blue macaw horns. *Head*—Gold twist.	A very gorgeous affair, and reputed a good killer. Sizes, 18 to 14.

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Name of Fly.	*Composition.*	*Remarks.*
43 THE SUN FLY.	*Tag*—Silver wire and golden floss. *Tail*—A topping. *Body*—Black dyed seal's fur, ribbed with gold twist. *Hackle*—Black cock's over the fur; bright blue dyed cock's at shoulder. *Wing*—Entirely composed of toppings; blue chatterer cheeks, blue macaw over. *Head*—Black chenille.	So named because of its reputed excellence in bright weather. It is usually dressed in small sizes for low water; and black floss is often used instead of seal's fur.
44 THE PARSON.	*Tag*—Silver tinsel and violet floss. *Tail*—A topping or two, some tippet sprigs and a blue chatterer. *Body*—One-fifth gold floss; remainder, rich yellow mohair merging into orange, ribbed with silver twist. *Hackle*—Orange dyed cock's over the wool, and full at shoulder. *Wing*—A tippet feather and two soft cock-of-the-rock plumes. A slice of wood-duck on either side, blue chatterer cheeks and a liberal allowance of toppings over; blue macaw horns. *Head*—Black chenille.	The vestments of this ecclesiastic are of the florid type. The fly was designed by and named after the Rev. Alfred Meyrick of Romsbury. Sizes, 18 to 12.
45 THE STEVENSON.	*Tag, Tail, Body* and *Hackle*—As in the Parson, except that the shoulder hackle should be bright blue dyed cock's or (better) Indian Jay.	I have a double hooked Stevenson of my own dressing, which I lost in a fish on the North Tyne one day in 1873. Two days

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Name of Fly.	*Composition.*	*Remarks.*
45 THE STEVENSON (*continued*).	*Wing*, &c.—As in the Dandy (No. 8).	later, the Duke of Northumberland caught this fish, 17 lbs., about half a mile higher up the water. My fly was sticking in its breast; I put it on my line and landed two fish with it the same day. Sizes, 16 to 5.
46 THE LEMON AND YELLOW.	*Tag*—Silver wire, lemon floss. *Tail*—A topping. *Butt* — Black ostrich herl. *Body*—Silver-grey fur, ribbed with silver tinsel. *Hackle*—Mottled Scots grey cock over wool; clear lemon dyed cock's at shoulder. *Wing*—Mixed, sprigs of tippet, brown mallard, florican or bustard, grey turkey, strips of grass-green, crimson and violet dyed swan. *Head* — Black ostrich herl.	This is one of a numerous class of Irish flies, the merit of which consists in their jaunty and tasteful dressing. The varieties are endless, but all retain a character which I have never seen rivalled by British dressers. It will be observed that black ostrich herl is prescribed instead of the more durable chenille, because it is impossible to retain the airy, aristocratic character of Irish flies except by the use of tasteful material. But, of course, this has no effect on salmon. Sizes, 17 to 7.
47 THE DUN TURKEY. (Plate IV. Fig. 4.)	*Tag*—Silver tinsel. *Tail*—A topping and Indian crow. *Body*—Yellow, orange, claret and black mohair, blended successively into each other, and picked out, ribbed	At one time this fly and the next were considered infallible and indispensable on many rivers. The body was subject to variation, being at times

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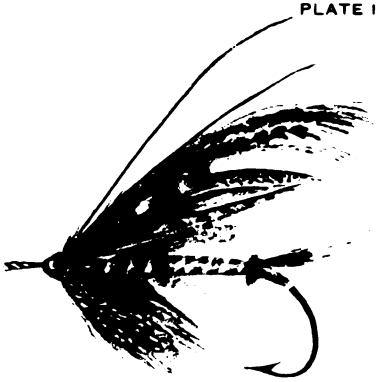
to face p. 170.

PLATE IV.

1. THE SIR RICHARD



2. THE JOCK SCOTT

3. THE AJAX

4. THE DUN WING

5 THE DANDY

6. THE DURHAM RANGER

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Name of Fly.	*Composition.*	*Remarks.*
47 THE DUN TURKEY (*continued*).	with doubled gold thread. *Hackle* — Dark claret over wool, bright blue at shoulder. *Wing*—Two slips of dun (reddish-brown) turkey, with whitish tips. *Head*—Small, black varnish.	all black or all brown; sometimes the blue hackle at the throat was dispensed with. Now, the breed of dun turkeys is well nigh extinct, and it is difficult to get the feathers. Sizes, 18 to 9.
48 THE BROWN MALLARD.	Similar in every respect to the dun turkey save that the wing is of two slices of the brown mottled scapular of the mallard.	In one variety the body is half of yellow, half of black wool, with black hackle at throat. Sizes, 14 to 5.
49 THE WHITE WING.	*Tag* and *Tail*—As in No. 47. *Body*—One third scarlet pig's wool, remainder black pig's wool, ribbed with broad silver tinsel. *Hackle* — Dyed dark claret over wool; dyed sky blue at throat. *Wing*—Two slips of pure white swan. *Head*—Small, varnished.	A redoubtable Tweed champion, survival of an earlier and simpler age, but still considered unrivalled for evening fishing. Sizes, 19 to 14.

CLASS D.—WINGLESS FLIES.

50 THE AJAX. (Plate IV. Fig. 3.)	*Tag*—Silver tinsel and scarlet pig's wool. *Tail*—None. *Butt*—A coch-y-bondu hackle (red cock's with black butt), and a couple of tiny scale-like jungle cock tied-in, one on each side. *Body*—fine sulphur-coloured and black chenille, laid on side	This is one of the "grub" pattern from the Usk. It may be used in all sizes, and takes fish very readily, as I have found in the far north. It is unnecessary to give more samples of wingless flies, as they may be made

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Name of Fly.	*Composition.*	*Remarks.*
50 THE AJAX (*continued*).	by side, so as to give a wasp-like effect. Half way up the body the coch-y-bondu hackle and jungle fowl is repeated, then the yellow and black chenille is resumed, carried up to the shoulder, where a third hackle, similar to, but larger than, the others, is wound on, with jungle fowl as before. No wings. *Head*—Small and varnished.	in all colours and of various materials. Sizes, 16 to 7.

Such are some of the most typical and characteristic patterns of salmon flies. The direction given for dressing them are those most commonly accepted as orthodox, and sometimes insisted on as essential to success. The ingenious amateur will please himself in following his fancy to improved designs. Even if he shares the extremely rationalist (and, as I hold, rational) views enunciated above, and believes that a vast deal of elaborate nonsense has been talked and written on the subject, yet he will take pride in turning out a workman-like article. Thus, if a fly approaching completion betrays a tendency to a hollow chest, the artist will be ready to throw in another hackle at the shoulder. An extra topping over the wing sometimes adds greatly to the lustre of the insect, and he who takes up fly-dressing as a serious occupation will find ample amusement in collecting new materials, attractive feathers and delicate dubbings and silks.

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CHAPTER VII

FLY-DRESSING

WHATEVER difference of opinion may prevail as to the necessity or expediency of a variety of salmon-flies, however coldly philosophical may be the view taken about the merits of attractive colours and complicated construction, all anglers who have experienced it must agree that the interest and pleasure of salmon-fishing are immensely enhanced for the man who ties his own flies. The art is not a difficult one to acquire from the instruction of a skilled practitioner. Most vendors of fishing tackle of any importance retain on their premises the services of a fly-dresser, and permit him to give lessons to amateurs for a moderate fee. Once proficiency is attained, this accomplishment will be found a fund of constant occupation and refined interest to one who has leisure to devote to it.

For every good fishing day in the year, when the state of the water, the weather and the presence of fish encourage one to remain by the river side, there are many days when it would be as profitable to flog the sand of the sea shore as to angle with

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fly in the stream. Well did the late witty Mr. G. P. Bidder, Q.C., express the experience of all of us when he penned these lines—

"Sometimes too early and sometimes too late,
Sometimes too little and sometimes in spate
Sometimes too windy and sometimes too calm,
Sometimes too frosty and sometimes too warm;
Sometimes too dirty and sometimes too clear—
There's aye *something* wanting when I'm fishing here."

The amateur fly-dresser is never at a loss. If he can't fish, he can at least ply his fingers and exercise his thoughts in preparing for fishing; and not the least part of the advantage he enjoys is that of being able to make acceptable presents to his friends or to offer some return for the hospitality which may be extended to him. There is no gift which imparts surer gratification to both giver and receiver than a dozen tasteful samples of the fly dresser's skill, in the glitter of tinsel, sheen of floss-silk and lustre of many-hued feathers.

Nor need those who make an honest living out of the weaknesses of anglers fear that their profits would be impaired if half of those who fish for salmon were to take to "busking" their own flies. In the first place, it is out of the question with far more than half the salmon anglers of the United Kingdom that they should attempt to do so. Many of them are busy men, snatching brief holidays at long intervals to devote to their darling pastime. To others, salmon fishing is only one out of many field sports which they are privileged to enjoy; and as for the residuum—those who can find leisure and have the patience to acquire the requisite skill, it is probable they will spend at least as much in raw material as they would do in

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the manufactured article. Wood-duck feathers at sixpence apiece, golden pheasant toppings at from a penny to sixpence each, blue chatterers at from 12*s.* to 18*s.* a skin—all these and other fanciful components of fashionable salmon flies at retail prices, soon mount up a long bill, and there are very few amateurs who could claim to produce their own flies at a price which any tradesman would venture to charge.

Now it is scarcely possible to learn to dress a salmon fly from written instructions.[1] Half a dozen lessons of an hour each at the hands of an expert will convey more than sixty hours' study of the printed page; nay, in half dozen of hours may be imparted all that there is to be learnt. After that practice is the only requisite to proficiency. Nevertheless, a chapter on fly-dressing may not be useless as an aid to memory, which sometimes plays strange pranks with oral instruction.

On the following page is a typical salmon fly, with the various parts thereof indicated.

How to dress a salmon-fly

If you adhere to the old plan of lashing a loop of treble gut to the hook, it saves a vast deal of time and mechanical labour to buy the hooks prepared in that way by the tackle maker. If you prefer to perform the whole operation from the beginning, then take a length of treble gut, fine or thick in proportion to the size of the hook, cut off a bit about half as long again as the hook, moisten and double it, leaving one end an eighth of an inch or

[1] Since writing this I have, for the first time, read Mr. Kelson's book on *The Salmon Fly*, and must pay him this compliment, that his instructions for fly dressing are far the best I have ever seen.

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so longer than the other. Pass the stiletto (Fig. 40) through the loop while still moist so as to give the gut a nice set, squeeze the two ends well together, and lay the gut aside *till it is dry*. This is important, because silk lashed over wet material will be found to slacken after drying. Then take up the hook in your left hand (a vice is superfluous

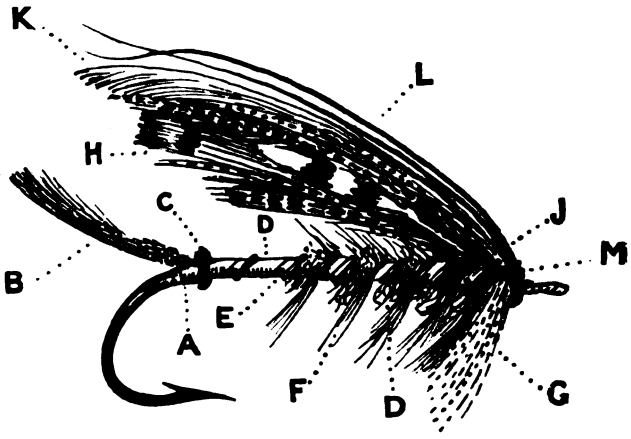

FIG. 39.—THE PARTS OF A SALMON FLY.

A. Tag.
B. Tail.
C. Butt.
D D. Body.
E. Tinsel.
F. Body hackle.
G. Shoulder hackle.
H. Wing.
J. Cheek.
K. Topping.
L. Horns.
M. Head.

in all stages of salmon fly-dressing), and, about one-eighth of an inch from the end of the shank, take two or three turns with a well waxed piece of fine glover's silk. If the hook is a large one, the silk may be used doubled, but on no account let thick silk be employed. Next, lay the gut closely along the hook, leaving a loop of convenient size projecting beyond the head of the

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shank, and cut off the ends of the gut unequally, if they project further down the shank than what will be the body of the fly. Then lap the silk firmly and smartly round both gut and metal till

FIG. 40.—STILETTO.

you arrive just short of the place where the tag and tail will be placed, and finish off by hitching the silk twice under itself.

In this, as in all other stages of fly-dressing, much time and material will be saved if a dozen or so of hooks are treated in succession. Thus, a dozen loops may be attached to as many hooks, then a dozen tags and tails put on, a dozen bodies finished and so on, all the materials having been prepared and arranged beforehand.

Single hooks offer much more attraction to the fly dresser than double ones. In the first place, they are much easier to hold and manipulate; then the fly when finished is a much more elegant object; lastly, flies on single hooks are far more conveniently stored and exhibited than those tiresome double metals. Nevertheless, double hooks are so greatly preferable, in the opinion of most fishermen, to single ones that sooner or later the difficulty of handling them must be overcome. However, for a first attempt, and, indeed, for many successive ones, you had better take a single, rather a large hook on which to exercise your fingers.

Well, the gut loop having been securely lapped to the hook and the tying fastened and cut off, let us suppose that it is intended to proceed with the

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construction of some typical fly—say a Poynder of medium size. The materials up to the fixing of the shoulder hackle are these—some silver wire, a short piece of sky blue floss, a longer piece of golden floss, a smallish feather, called a topping, from the crest of the golden pheasant, and a little feather, of exquisite tourquoise hue, from the body of the blue chatterer (*Cotinga*), some orange, scarlet and deep blue pig's wool (mohair for small sized flies), a few inches of flattened silver twist, and two cocks' hackles—one dyed claret, the other sky blue Before anything else is done, these hackles must be prepared for laying on—a delicate operation which will cost the beginner some trouble and many failures before it is accomplished. Once the knack is learned, it comes as easy as the twirling of a moustache.

Attach one of the hackle holders represented in Figs. 41 and 42 to the stalk of the claret hackle;

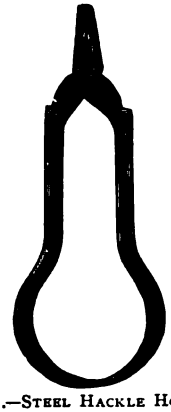

FIG. 41.—STEEL HACKLE HOLDER.

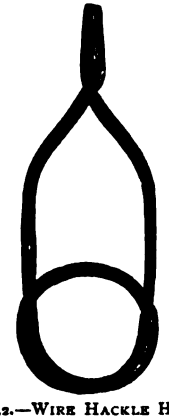

FIG. 42.—WIRE HACKLE HOLDER.

then seize the point of the hackle with the fore-finger and thumb of the *left* hand, and allow the

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feather, weighted with the hackle holder, to lie across the palm. Pass the thumb and forefinger of the *right* hand gently down the hackle from near

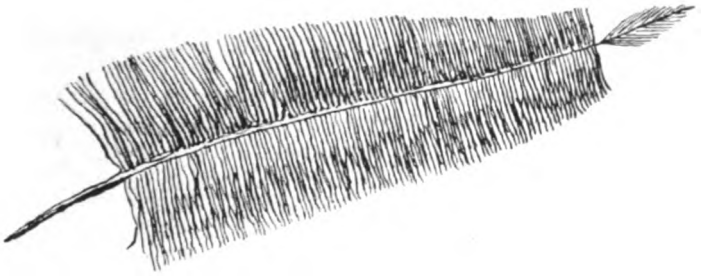

FIG. 43.—HACKLE IN FIRST STAGE OF PREPARATION.

the point, drawing back the fibres so that they stand out at right angles with the quill (Fig. 43). Now comes the crucial part of the process. Slightly moisten the thumb of the *right* hand; lay the hackle, shiny side down and still weighted with the hackle holder, along the forefinger of the same hand, which must be kept perfectly firm and steady, and with the thumb draw the fibres lying furthest from you over those on the nearer side of the quill,

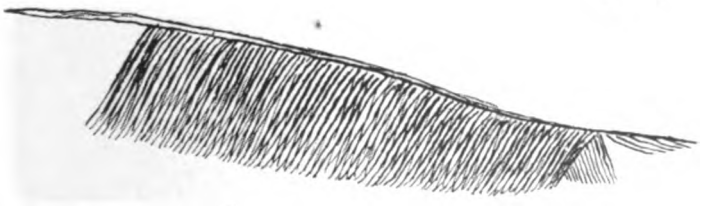

FIG. 44.—HACKLE IN SECOND STAGE OF PREPARATION.

pressing them down, so that, when released, the fibres on the two sides of the hackle remain at a new angle to each other, like the roof of a house

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(Fig. 44). Treat the blue hackle for the shoulder in the same way, remembering that the fibres thereof should be rather longer than those of the body hackle. Experience and a sensitive eye soon will guide the amateur in the choice of hackles proportioned to the fly. Nothing looks worse, or betrays so surely the unskilled hand, as the display of body hackles too long, or shoulder hackles too short. Note, also, that if the whole length of a hackle is not required for the shoulder, part of it may be snipped off before undergoing the second part of the process.

The next material to receive attention is the pig's wool or mohair. Pig's wool is a somewhat intractible material, but its durability makes it invaluable for flies of large size. Take a pinch of each colour required, keep them scrupulously separate, and tease each of them vigorously with the fingers, tearing the hairs apart and rolling them into a little mass like soft felt.

Now wax thoroughly a piece of fine but strong glover's silk. It is best not to wax the whole length at first; apply the wax to a few inches of the silk only, and when that is used up, wax a few inches more. The fingers are kept much cleaner in this way than by handling a long piece of waxed silk, and it will soon be perceived how necessary clean fingers are when delicate floss and tinsel, and brilliant feathers have to be dealt with.

Judge with precision the exact place where the tag of the Poynder is to come; take a turn or two with the waxed silk at the precise point, and whip on the end of the silver wire, laying it away from the head of the fly. *Never make a knot or fastening in your tying silk from beginning to end of the body;*

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this is a cardinal rule. After tying in each successive piece of material, carry your tying silk forward to the head of the hook shank, and catch it between the metal and the gut, where it will hang ready to be resumed when the new material has been adjusted.[1] As Mr. Kelson is the only writer on fly dressing who, so far as my reading goes, recommends this mode of catching the silk between each stage, instead of making a knot or hitch, I shall adopt his term "make off" to express it.

Now, holding the hook in the left hand, with the point of the shank turned to your right, seize the silver wire with the right hand, carry it out along the bend of the hook to the proper limit of the tag, and then lap it neatly back over itself to the place where it was tied in, unmake the tying silk and bind in the wire, snipping off what is over, and make off the silk as before. Take the sky blue floss and, having smoothed it nicely with clean fingers, unmake, bind in the end of the floss, make off, give the floss two, or at most three, turns close to the silver wire, unmake, bind in again, cut off the rest, and make off.

Now it is the invariable tendency of beginners to spread out the earlier parts of the fly too widely. If the tag which you have just constructed be compared with that in the model which ought to be before you, it will be found to occupy considerably

[1] I have never tied a fly on an eyed hook, and, having got into the convenient habit of hitching the tying silk temporarily as described, I certainly should find myself at considerable loss to know how to dispose of it. But my experience of eyed hooks for salmon flies has been so unpropitious, that I have no desire to use them instead of those attached to loops of good treble gut.

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more space on the hook than it ought to do, and you must not proceed till this is set right, or the fly will be thrown out of proportion in all its parts. Of course, as rational—more or less rational—beings, salmon fishers know quite well that the tag—its size, shape, colour—its very existence—are of absolutely no real importance in the eyes of the fish; still, if fly dressing is to hold the place it has won among the fine arts, the canons of that art must be respected, and a workman-like article cannot be turned out without scrupulous attention to the relative space assigned to the various parts.

After the tag comes the tail, for which you must have ready a neat topping, from which the whitish, fluffy fibres next the root must be stripped, the stalk nipped with the finger nail to receive the tying silk, and the feather laid on with its brighter side against the hook. Unmake, and tie on with three or four firm laps, making off again. Take the blue chatterer, treat it in the same way as the topping, but lay it over the butt of the topping with the bright side *uppermost*, unmake, whip on and make off again. Be careful to renew the waxing of the tying silk from time to time.

After the tail is on and sits to your liking, in most flies follows the butt. (Fig. 39, C.) In the Poynder, however, the butt is generally dispensed with. If it is decided to have one, it must be formed by tying in a piece of peacock or ostrich herl, or fine chenille, giving it a couple of turns close to the root of the tail, tying again, snipping, and making off. Most fly dressers use herl, either of ostrich or peacock, for butts and heads; and no doubt herl gives the most elegant finish to a fly. But it is sadly vulnerable by the teeth of a fish, and

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fine chenille will be found far preferable. It is extremely tough and durable, and may be had in almost any colour desired.

We pass now to the construction of the body; it behoves the artist to remember the relative position to be occupied by the several components thereof, and to tie them on in their right order. First, there is the silver tinsel. See that it is perfectly bright, and, if necessary to that end, give it a rub over with a bit of chamois leather and rouge. Lay it against the hook, directed towards the bend, unmake, lap firmly to the hook and make off. Treat the golden floss in the same way, and wrap it smoothly over the shank so that it may occupy not more than one-fifth of the body, which means about one-seventh of the shank in front of it. Next comes the claret hackle. Lay it as you did the silver twist and floss, binding in the tip of the small end close in front of the floss, make off as before, keeping the rest of the hackle directed towards the bend of the hook, with its legs upwards. Fig. 45 shows the fly at this stage; the tag, tail, butt and floss silk are finished; the tinsel and hackle are tied in ready for laying on, and the tying silk is "made off." Now unmake again, and, taking a small pinch of the yellow wool between finger and thumb, twirl it into a shape like coarse worsted, twist in the tying silk with it and lap them both together two or three times round the shank. Treat the scarlet and blue wool in the same way, taking care to leave enough of the shank to receive the shoulder hackle and wings. Make off, and return for the silver tinsel, which must be wrapped in an even spiral over the floss silk and wool; unmake; lash down the

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twist, make off, and snip off what remains unused of the twist. Then seize the stalk of the hackle with the pincers, and carry this feather round beside and *behind* the twist over the whole of the wool, pressing the fibres of the hackle into place with the middle finger of left hand as

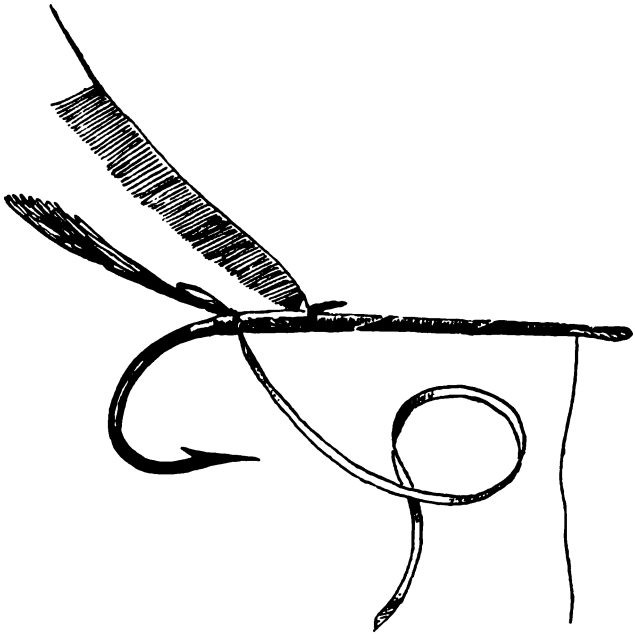

FIG. 45.—FIRST STAGES OF SALMON-FLY.

you go along. Unmake tying silk, lash down, make off, and snip off the stalk of the feather. The blue shoulder hackle must then be taken and treated in the same way, except that the requisite number of turns—three, four, or more—must be made close together on the shoulder of the fly, clear of the body altogether. Lastly, the gallina hackle must

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be tied in and wound round above the blue hackle, and the stalk snipped off. Take the stiletto and tease out the wool of the body to the degree of roughness desired, taking special care not to injure or loosen the hackle. That completes the body; you may now fasten off with a couple of hitches of the silk round the shank and under itself; touch with varnish and lay it aside to dry before applying the wing. Before doing so take the stiletto again; gently pull out the fibres of the wool to a suitable degree of roughness, and release the fibres of hackle which may have got bound in during the tying.

Throughout the whole of these complicated operations it will be noted that until arriving at the shoulder, there is not a single knot tied in the silk. Yet it will be found that this dressing is just as durable and firm as if the silk had been knotted after each stage of the proceedings, as the manner of some is, and as most writers on the subject recommend. Knots are utterly unnecessary; they consume time, and the best silk has a malignant habit of snapping just as the knot is drawn tight. I owe to dear old Mrs. Hogg, of Princes Street (now with the angels, perhaps with a pair of superfine mixed or "Ranger" wings) the secret of dispensing with knots, and the knack of making off the tying silk into the notch between the gut and the head of the shank during pauses.

By this time the novice, if a man, will be in a profuse perspiration and his throat parched like the Rock of Aden; if of the fair sex, she will display a most becoming heightened colour in her cheeks; in either sex the brows will be throbbing, the fingers will be cramped and the eyes aching. The result, also, of which these discom-

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forts are the price, may be far from satisfactory. Never mind: initial difficulties will not recur again in the same intensity, and the most obstinate materials yield wonderfully soon to intelligent perseverance.

The next operation in building up a Poynder is the most difficult of all, for it involves the preparation and application of what is known as a "mixed wing," which really means a pair of mixed wings. All the fibres composing the right wing, *i.e.*, the wing nearest the operator as he holds the hook in his left hand with the head of the shank pointing to his right, all these fibres, I say, must be taken from the right side of the feather. Some feathers, such as many of the turkey or bustard, supply fibres of nearly equal length, consistency and colour on both sides of the quill; others, like those of the mallard and wood-duck, grow suitable fibres only on one side (Fig. 46, *A*, *B*). Whichever kind be employed it is indispensable that none but right-side fibres find a place in a right wing, and left-side fibres in a left wing, otherwise they will not cling properly together and assume that shapely, glossy appearance which is of the essence of an artistic mixed wing.

For the Poynder wing, then, take a good slice of dark bronze turkey with white tip. Do not cut it with the scissors, but nip it out with the skin of the quill adhering, in a manner to which your fingers will soon become accustomed (Fig. 46, *C*, *D*). In like manner, pull strips off the tippet feather of the golden pheasant and from a brown mottled scapular of the mallard, and the feathers of bustard or, preferably, florican, and pintail, with pieces of scarlet and yellow dyed swan, and lay them to-

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gether—right-side fibres and left-side fibres in two little heaps. Touching the use of brightly dyed swan, it must be noted that only two or three fibres of each colour should be employed, the object being to impart a rich sparkling effect to the wing, rather than glare. Add to these a few fibres from the emerald rump feathers of a peacock. Then take up the bronze turkey with white tip,

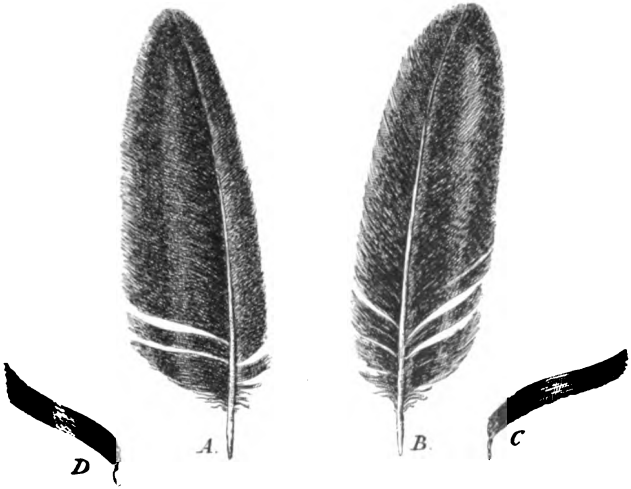

FIG. 46.—RIGHT AND LEFT FIBRED FEATHERS.

let that be the basis of the wing; lay all the other fibres on the top of it, carefully adjusting the length of each by laying the tips of the fibres near together, and squeeze, press and coax them to adhere as closely as if they had originally all sprung from one quill. They will do this, in a wonderfully coherent manner, even though their original owners lived in opposite hemispheres, and then the roots or butts may be snipped off. You

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must then pinch the several ends of the fibres into a neat, manageable space, and, having first adjusted and waxed the tying silk, bind the right wing firmly upon the shank of the hook, cut off the projecting ends neatly and make off the silk as before. The left wing is to be treated in the same way, being composed only of left side fibres. You must not expect to succeed in this at once, for the right composition and adjustment of a mixed wing is the crowning test of the adept. You may find that the wings, seemingly so securely bound, have an exasperating trick of wriggling themselves loose after the operation. They either come to pieces —fibre by fibre—or else wobble at the roots in a manner that betrays all too surely the 'prentice hand and impels the mind to thoughts of suicide. Don't give way to that; the difficulty is not insuperable; what *is* insuperable is the task of explaining in print how the difficulty is to be overcome.

We are approaching the culminating glory now. Take two of the wax-like hackles of the jungle-cock, from the right and left side of the neck respectively. Strip off the downy fibres at the base and lay the right side hackle along the outside of the right wing, so that it shall be about half the length of the wing; bind it firmly on and treat the left side hackle similarly on the other side. If the fly is of large size, you may add a turquoise feather of the chatterer on either cheek, still remembering to take the right and left cheek feathers from the corresponding sides of the bird's body. The wing is finished by the addition of a golden pheasant topping over all, tied so that its curving tip may just overlap the mixed fibres

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composing the wing, and give it a sheeny appearance.

A piece of black chenille must now be tied in, pointing to the tail of the fly as usual; make off the silk again, give the chenille a couple of turns over the tying of the wing, unmake, bind the chenille down, snip off the surplus, make off, and the head of the fly is complete. If you have judged your spaces accurately (which is far from probable on a first attempt) there will still remain the sixteenth part of an inch of bare metal. Take two strands from the tail feather of a blue macaw, a right side and a left one, and bind them as horns upon the vacant space. Finish off with a few laps of the silk round the metal shank only, so as to protect the gut from chafing; give the silk a couple of hitches under itself, snip off the loose end, apply a drop of varnish, and your Poynder is complete. Hang it to dry, and retouch with varnish before using or putting away.

The most troublesome part of dressing this fly has been the compounding and tying of the mixed wing. It will be found an advantage to devote a morning solely to the composition of such wings. These can be put aside in cardboard boxes or parchment cases for subsequent use; they will maintain their separate identity perfectly well, and the dresser will be spared the trouble of hunting up a great variety of feathers to provide the requisite fibres.

Personally, in composing the wings of Poynder or Jock Scott, I used always to tie on the bronze turkey with white tips first, that being the dominant characteristic of the wing, and to add the varied mixture afterwards. When this is done, or when

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a plain wing is desired, like those of the Dun Turkey, the Brown Mallard or the White-wing, the butt of the slice should not be cut off before the wing is tied on. It is of great moment that the fibres of a plain wing should adhere closely and lie smooth. If the butts of the fibres are cut off before tying, one fibre or more is sure to be turned over in tying down. This is of no moment in a mixed wing, because the obstreperous fibre may be removed after; but in a plain wing every fibre is of importance to the whole, and cannot be spared.

From the directions given for a Poynder, the reader may gather sufficient instruction to apply to the construction of other flies; though I cannot advise him too strongly to disregard all that I have written, and go direct to a professional tyer, who will carry him further in half-a-dozen lessons than I could in as many volumes. But there is one class of salmon flies in high vogue at present, those, namely, of which the bodies are chiefly or wholly composed of tinsel, which require a little further explanation. In order that the tinsel may lie flat and display a solid appearance, the body of the fly must be lapped over first with floss silk or worsted as a substratum for the tinsel. Some dressers gradually thicken this groundwork towards the shoulder, which gives the tinsel body a very showy and fish-like appearance.

The fly-dresser's paraphernalia

A word now about the fly-dresser's apparatus and materials. The apparatus may be the reverse of elaborate. A leather book-like satchel, with numerous pockets for the larger feathers, parchment envelopes for the smaller ones and for hooks, tinsel and twist wound on cards, slips for holding floss

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silk, and wells for pig's wool and mohair of different colours, is extremely convenient for travelling. Its permanent home should be in a tin box where the general store of feathers is preserved, with plenty of camphor and pepper to discourage moths.

No vice is required for salmon flies, and the only instruments necessary are a pair of scissors bent at

FIG. 47.—FLY-DRESSING SCISSORS.

the points (Fig. 47), a stiletto (Fig. 40) and a pair of brass or steel pincers or hackle-holders (Figs. 41 and 42).

There would be no reason to wish for anything better than cobbler's wax, were it not for the necessity for keeping the fingers clean. With care this can be done, but it is difficult. If the wax gets dry and brittle, either throw it away and get some more in the village, or work a little tallow into it, when it will resume its amiable consistency.

Wax

For many years I used the following recipe for white wax, which I got from Francis's *Book on Angling* and found it admirable and pleasant to handle.

Simmer two ounces of the best resin and a quarter of an ounce of beeswax over the fire for ten minutes; then add a quarter of an ounce of tallow and simmer for a quarter of an hour. Pour it out into cold water and work it into convenient shapes with the fingers.

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In fly dressing it will be found a great advantage to work with a good light from the left. It is no use increasing the strain on the eyes, and this is the position in which the light is of most service. I often see people writing or doing some work which, like fly dressing, requires close attention to details, seated with their faces to the light. To do so is an unnecessary expenditure of effort.

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CHAPTER VIII

SALMON-TROUT FISHING

THE term "sea-trout" is rather an ambiguous one, being used to designate different species in different localities. Thus in the Tweed the name is applied to *Salmo cambricus* (*eriox*), a coarse, bad-rising fish, known elsewhere as the bull-trout or sewin, which may be dismissed from the fly-fisher's consideration after very few words. Indeed, were it possible to extirpate the bull-trout from the United Kingdom, great would be the gain to anglers in general, for in some rivers, such as the Aln and Coquet in Northumberland, they swarm to the utter exclusion of more desirable fish. In other rivers on the same coast their presence cannot but be inimical to salmon, because they are very voracious in the kelt state and destroy a considerable number of fry.

Salmo cambricus

Bull-trout are much more abundant on the east coast of Scotland than on the west, and it is to be feared that they are increasing in numbers. Fifty years ago Stoddart wrote of this fish as a recent invader of the Tweed, and mentioned that, at that time, the old fishermen affirmed that, thirty years previously, it had been looked on as rare. In all

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rivers where they come, they earn the displeasure of anglers.

Yet it is tantalising that *Salmo eriox* does not possess more sporting propensities, for he is a comely and powerfully built fish, shows fine fighting power on the comparatively rare occasions when he does take the fly, and though the flesh is inferior to that of the salmon, and the fish therefore command a lower price in the market, it is by no means despicable food. Also the bull-trout attains a very considerable size. Francis reports having inspected one of 32 lbs. taken in the nets on the Tay near Perth.[1] Stoddart testifies to having seen one taken out of the Carron, in Ross-shire, weighing 24 lbs., and of those taken with the rod in the Tweed, many scale from 8 to 10 lbs., while in the nets 14 lbs. is by no means an extraordinary weight. All that is wanting to give the bull-trout the next place after the salmon as a sporting fish is a requisite degree of that curiosity, irritability, playfulness, or other motive, whatever it be, that impels the salmon to pursue the artificial fly. But, as matters stand, no angler need concern himself to go fly-fishing for bull-trout. He will catch an occasional specimen when fishing for salmon in waters where bull-trout abound, and far more than he cares for in the kelt state when angling for river trout with the March brown in spring. Stoddart ascribed greater strength and boldness to the bull-trout when hooked than to the salmon, but this opinion will not be generally endorsed. The bull-trout has a peculiar way of rolling and splashing

[1] *By Lake and River* (London, 1874), p. 255. Mr. P. D. Malloch informs me he has seen bull-trout of 40 lbs. taken in the Tay.

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about on the surface after he is hooked, an operation which is sometimes prolonged for a considerable time; but when he goes below, and behaves in a gentlemanly way, his powers do not exceed those of a salmon of the same weight.

But I am willing to concede superior fighting powers to the fish more generally known as the sea-trout—or salmon-trout (*Salmo trutta*), the white trout of Ireland. This lovely creature, even if, pound for pound, it is not more powerful than the salmon, is wont to exercise its powers in a manner more exhilarating to its captor, making sea-trout fishing one of the liveliest and most exciting kinds of sport to be had with rod and line. The name sea-trout having been appropriated in the Tweed to the bull-trout, *Salmo trutta* is known in that stream as the whitling. A Gaelic version of the same name—finnock (*fionach*, from *fionn*, white)—is applied in the West to the grilse or adolescent stage of *Salmo trutta*, and this class of sea-trout is known also in some Scottish rivers as herling. In Ireland, as above-mentioned, *Salmo trutta* is called the white trout; in Welsh rivers the sewin probably is a common term for that fish and the bull-trout, while further south they are known in common with sewin as peel, though that name is also applied to the grilse of salmon. Salmon-trout are strangely capricious in their choice of favourite streams, but very constant in returning annually to those streams for which their favour is shown. Innumerable instances might be mentioned in which large numbers of salmon-trout enter an estuary also frequented by salmon; but, while the salmon pursue their course up the main river, almost every salmon-trout turns aside into

Salmo trutta

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some tributary, where they afford excellent sport. Like salmon, they are very fond of congregating in lakes, before repairing to the spawning grounds, and rise freely to the fly in such quarters. The most celebrated white-trout fisheries in the United Kingdom are those of Ballinahinch in Galway, where a chain of lakes discharge their waters through a short river into the sea. Splendid sport is often had here after midsummer, and the upper part of the district is now opened up by the railway recently constructed with the assistance of the Treasury. It used to be a long drive from Galway, through Oughterard, to Recess, where there is an excellent inn. I drove on a car that way not many years ago on Treasury business. We stopped to bait the horses at the Recess hotel, and I strolled down to the shore of one of the lakes, and watched an angler pulling whacking white trout into his boat. Returning to the inn I asked the manager how many rods could be accommodated with fishing at one time. "Well, sir," he replied, "we could be doing with nineteen. There was ten gentlemen here yesterday, but one was drowned, so there's only nine to day!" It was quite true. An unlucky angler from London had landed on an island to eat his luncheon; the boat drifted off; he tried to swim to it, got entangled in weeds, and perished.

There are countless streams all round our coasts, especially on the west of Scotland and of Ireland, where sport of a very exciting kind may be reckoned on with salmon-trout. Some of these streams are exceedingly small except in times of spate; then the fish crowd up from the sea, each one of them a model of brilliancy, symmetry, and activity, and the fun is fast and furious.

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As a rule, salmon-trout do not ascend the fresh water till the grilse begin to run, though an odd one sometimes takes the salmon fly even as early as February.[1] But the main body make their appearance with the grilse, the heaviest fish running up first. In most good sea-trout streams, fish of 2 lbs. and 3 lbs. are plentiful in June, though four-pounders are far from uncommon, and heavier weights may be expected.

Tackle for salmon trout

The fishing cannot be said to offer many difficulties or to call for much refinement when there is a fresh in the stream, though the fisherman must be adroit and up to his work when a fish is hooked, for these fish are very rapid in their runs, throwing themselves repeatedly out of the water. The rod must be proportioned to the size of the stream rather than to that of the fish; but even in the largest rivers, when fishing exclusively for sea-trout, nothing over 15 feet can be reckoned desirable. Salmon-trout, though they frequent deep water as much as salmon do, also lie in comparatively shallow streams, where they rise more freely and show more sport. He who, desiring to cover every place where a fish may be, encumbers himself with a heavy rod, thereby robs salmon-trout fishing of half its charm. Fish from 1½ lb. to 3 lbs. weight, which may be taken as the commonest range of size in June and July, do not get a chance of displaying their quality at the end of a great salmon pole, nor can they be hooked with any certainty when such an unwieldy implement is in hand. It is far better to take one's chance with a split cane

[1] I have known clean sea-trout of 2 lbs. take the largest salmon flies in the Thurso in that month.

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trout rod of 12 or even 10 feet, wading pretty deep if the general lie of the fish is far from the banks. Much more water can be fished effectually by such means than by using a long rod and line, and, if the man who uses the smallest gear is as weary at the end of the day as his rival with a 16 or 17 feet greenheart, it will be because he has a greater weight of fish to carry.

The reel line for salmon-trout fishing must be proportioned to the rod which is to cast it, and should be composed of plaited waterproofed silk. It is not prudent to have less than 70 or 80 yards on the reel, especially in lake-fishing, for a salmon-trout of 6 or 7 lbs. takes a lot of killing, and fish of this size, though not commonly met with in British waters, are very far from being out of the question. Moreover, if there are salmon in the water, as is often the case, you are just as likely to take one with a sea-trout fly as with any other. The first salmon I ever killed, in those far-off days when life stretched out in front, like a seamless, glittering carpet spread alike over the sands of commonplace, the sloughs of disappointment, and the rocks of defeat—my first salmon, I say, was hooked in this way, and I had a fine struggle to land him, with neither gaff nor landing-net. A friendly passer-by got hold of the fish by the tail, and I would give a good deal to experience afresh my sensations, as I laid it out on the shingle—17 lbs., fresh from the tide.

The casting line must be of fairly stout gut—as stout as the nature of the water to be fished will permit consistently with prudence, and as fine as the size of the fish expected will allow with safety. It is equally foolish to use gut so coarse as to run

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the risk of scaring fish from the fly (for the white trout in thin water is more shy and circumspect than a salmon in deep), and so fine as to endanger your chance of landing a five or six-pounder (not to mention a stray salmon or grilse), should you be lucky enough to hook one of that size. The three sizes of gut known as Padron 1st and 2nd, $\frac{14}{1000}$ to $\frac{16}{1000}$ of an inch in thickness, and Marana 2nd, $\frac{16\frac{1}{2}}{1000}$ to $\frac{17\frac{1}{2}}{1000}$ of an inch, are about the right thing; and every tackle-maker will know what to supply on being asked for sea-trout casting lines.

Sea-trout flies

The flies usually prescribed for white trout are as little like any known living creatures as those most in favour for salmon. On most waters the superiority of certain colours and patterns is insisted on by local anglers, though I am bound to say that my personal experience has not impressed me with the validity of the assertion. Dark shades are more deadly in some lakes and streams than light ones, while the contrary is the case elsewhere. Probably subaqueous and atmospheric conditions, of which terrestrial bipeds are not conscious, affect the degree in which shades of light and dark are visible to the fish; tinsel, too, from the peculiar way in which it reflects light, usually proves very attractive. The general truth to be borne in mind is that the sea-trout is an active, predacious creature, prone to seize any small object with a life-like motion which may pass near it, and that it is desirable that what we choose to call "flies" should not pass by unseen. A few favourite sea-trout flies are described on p. 207; one of Mr. Pennell's special patterns, dressed without wings,

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is shown in Fig. 48, as tied by Messrs. Farlow; while in Fig. 49 are represented three of the ordinary description as tied by Messrs. Hardy.

FIG. 48.—MR. PENNELL'S SEA-TROUT FLY.

Beware of buying cheap sea-trout flies from tackle-makers not in the first rank. In country towns one often sees bunches of flies displayed in the windows of ironmonger's or gunmaker's shops. These are snares, not for fish but for anglers. Gut exposed thus to sunlight is sure to be unsound, and you have no guarantee about the quality of the hooks. In white trout fishing, every part of

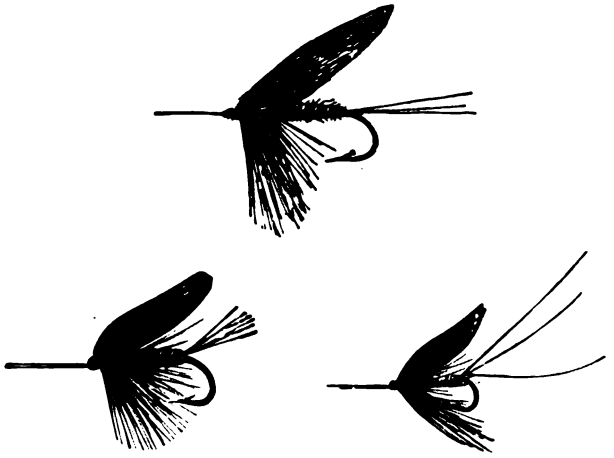

FIG. 49.—SEA-TROUT FLIES BY MESSRS. HARDY BROS.

the tackle ought to be of unimpeachable quality, because it will not only be tested by the fish you are after, but you are exceedingly likely to get

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hold of a salmon or grilse also. On the other hand, excellent flies may sometimes be obtained from such local artists as are known to be particular about the material they use; and it is always commendable to give these men some of your custom.

Two or three flies may be used on the cast. Never more than three—more than that number are sure to land you in untimely entanglement. It will be found convenient to have permanent loops for the bob flies on the cast, to and from which the flies may be quickly looped on and easily detached, for there is no occasion for scrupulously fine tackle.

As lakes frequented by white trout are most often exposed and liable to be swept by violent winds, it is seldom prudent to go out with less than a pair of stout rowers. There are always certain beats which the depth of water or the nature of the bottom render specially favourable for sport, and of course the stranger will be guided to these by the boatmen. But he who wishes to enjoy the utmost excitement which these game fish are capable of affording in a lake, may find opportunities of casting from the shore or wading. A fish hooked from the shore always makes a determined fight to get to the deep water. When the angler is in a boat he can take the somewhat unfair advantage of following a strong running fish; but standing on the shore or up to his middle in water he is practically stationary, and the fish will sometimes take out an immense length of line before he can be stopped. The extra labour of wading is considerable, the bag may not be so heavy at the end of the day, but the sport is infinitely more exciting. Young fishermen are

Mode of fishing

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somewhat slow to learn how much more the enjoyment depends on quality of sport than on quantity. For my own part, a dozen or half a dozen good hard-fighting trout caught from the shore, or by wading, are the source of infinitely greater pleasure than a whole boat load caught when afloat.

But wading in a lake is not to be undertaken except circumspectly. Rocks make it hazardous, and so does a soft bottom. A single false step may entail serious consequences. I have waded a great deal in lakes without mishap, but I have often speculated what would be the result of a fall in wading trousers. Would the enclosed air, as some people say, get into the broadest part of the trousers and cause the face of the angler to be immersed, while that aspect of his person which nature destined for a less conspicuous position was displayed to the heavens? I know not, and I hope that none of my readers will ever involuntarily put the matter to the test. But this is certain, that wading in lakes, or in certain parts of them, may be made perfectly safe with due caution, and that nobody has experienced the best form of sport in lakes until he has practised it.

Sea-trout may be taken in streams in various ways according to the state of the water. Here, as elsewhere, I confine my observations to fly-fishing, of which alone I have any experience—for which alone I have ever felt any inclination. Thousands of sea-trout are taken annually with bait in times of flood, but it is a pursuit so simple and uninviting that those who wish to indulge in it may well learn it for themselves.

Fly-fishing for sea-trout

For minnow-fishing, whether natural or artificial,

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there is more to be said; but it must be said by some one else, for I have never put it in practise. It may be a narrow view to take, but I hold that the use of the artificial fly so far excels every other branch of angling in excitement, in delicacy, and in fairness to a fishery, that it is the only one I can bring myself to recommend.[1] The most desired conditions are those which bring a river into fishing size after a period of flood. At such times prodigious numbers of sea-trout often ascend from the tide and may be taken in the pools. The flies are cast partly down stream and partly across, and must be worked at a moderate rate, not too fast, if it be desired to get the heaviest fish, for large fish are not so nimble on the rise as half-pounders. The check on the reel should be of sufficient stiffness to allow of the trout being effectively struck without the aid of a finger on the line. This is contrary to the practice of most sea-trout fishers, but it will be found of advantage. Sea-trout rise with a spirited dash; a fish of 2 or 3 lbs. weight, aided, perhaps, by the force of a strong current, causes a very sudden and powerful strain on the tackle; and if the line is held to the rod something is very apt to give way.

"Backing it up," as described for salmon on p. 80, will be found remarkably effective for salmon-trout if the water is heavy, especially in the

[1] Of course these remarks do not apply to those exceptional places where sea-trout may be taken in the sea by angling. The minnow is there not only excusable, but indispensable. Francis mentions the instance of one fisherman taking 30 lbs. weight, ranging from 1 lb. to 4 lbs., along the shore at Row, in the Gairloch. But it must be dullish work at times.

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proportion of those that are hooked. The rise of a trout is far more rapid than that of a salmon, and quick striking is necessary; so that if there is a belly in the line, as usually must be the case in fishing down a heavy stream, the fish is very apt to be missed. But when the stream is backed up from the bottom to the top, the line is always "stent," as Scots fishers say; that is, it lies evenly between the point of the rod and the flies.

There is one marked difference between salmon-trout and salmon or river-trout. These sometimes rise repeatedly at the fly, and, if not alarmed, even if pricked, may be taken at last. But the salmon-trout generally, it may be said always, refuses a second offer at a fly that he has missed. It is not easy to account for this peculiarity in such a bold fish, but it is a constant characteristic. The angler, however, is often recouped for this disadvantage by the number of fish in the water, for sea-trout ascend their favourite streams in shoals. It is not a rare thing for a single rod to take from fifty to one hundred sea-trout in a day in July or August on the west coast of Scotland, when the water is in good order, and to such sport may be applied the observation of Izaak Walton on a good pike properly cooked, it is "too good for any but anglers, or very honest men."[1]

It is not only in flood time that sport may be had with this delightful fish. There are two means of taking them with the fly in dead low water.

[1] I never have been able to understand Izaak's praise of the pike as food. I have tried them from all kinds of water—cooked in all sorts of ways; all I can say is that I have never been so hungry as to feel anything but disgust for them.

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At such times the fish are wont to collect in large numbers in the pools nearest high water mark; if there come a brisk breeze, preferably up stream, with a bright sun, they often rise to a tinselled fly in broad daylight. Sunshine, strange to say, seems necessary, or at least desirable for this sport, for a dull sky puts the fish down. The other way of catching sea-trout in low water is by night fishing, "a choice way," as Izaak Walton says of night fishing in general, "but . . . void of the pleasures that such days as these, that we two now enjoy, afford an angler." There is much truth in this; the cream of fly-fishing—the psychological moment—is the rise, and that cannot be seen in the dark. Nevertheless the night hath charms of its own—especially a northern summer night, when twilight, long lingering, almost joins hands with dawn—beauties less varied but hardly less delicious than the day. To spend occasional nights such as these in taking toll of the silvery shoals which work up with the tide, is quite sportsmanlike and fair, though it will be found that the sport has a degree of sameness which makes it inferior to daylight angling. As soon as the shadows have deepened on the landscape, just when the stars begin to show, take your stand beside a pool frequented by sea-trout. There is generally in every river some moderate obstruction, either natural or artificial, sufficient to stop the progress upwards of all fish, as long as the water is low. In the pools between such an obstruction and the sea trout collect in great numbers, and take the fly greedily as soon as the shadows deepen into darkness. You must strike very quick on the rise.

Low-water fishing

Night fishing

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If you wait till you feel the fish, you will be too late; strike directly a gleam on the dark water shows that a fish has moved at the fly. Besides this, there is not much art in taking the fish; they can see the flies, but cannot detect him who casts them. Often in the stillness of the night one may hear the ripple and splash of sea-trout entering the pool over the shallows close to his feet. The cast is made over the inky waters—a plunge, a screaming reel, and a wild fish dashing about the pool; your tackle is stout and you may hold on firmly, till somehow or other you scoop out a fine trout with the starlight glittering on his silvery coat. There is no need to change your position; the fish are creeping up from the sea through the shallow streams; you may stand in one place half the short night and catch as many as you will. Some people affect a white fly for night-fishing; others reckon black a great medicine; it does not seem to matter much what colour is used, only let the flies be stout and serviceable, without delicate hackles to be cut, for it is a difficult matter to change them in the dark.

Salmon and grilse are very seldom taken at night, even though there be plenty lying alongside of the sea-trout which rise so readily. I can call to mind only one instance of a salmon being taken in the darkness, in a pool near the mouth of the Luce.

Sea-trout flies are, mainly, of two classes; one, a miniature salmon fly; all the standard salmon flies that can conveniently be dressed on hooks varying from 8 to 4 in the Limerick scale may be used. Tinsel bodies answer very well, the Dusty Miller and the Silver Doctor being as good

Variety of flies

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as any. The other class consist of large trout flies, either the typical English imitations of March browns, red spinners, yellow duns, and so on, or Scottish loch flies, such as the red-and-teal, the woodcock-and-yellow and all the countless varieties with fur, silk or tinsel bodies. There is nothing that has more attraction for sea-trout than a large red palmer; if tied on two hooks, one behind the other, so much the better. The Welshman's coch-y-bondhu, the Zulu, the coachman, the governor—all dressed rather large—are very effective; indeed, it does not greatly matter what is shown to sea-trout when they are in the mood for mischief. But, in order to be in the fashion, I suppose I must give a few recipes, and the first shall be Francis Francis's favourite, which he says will kill "almost anywhere in Scotland, Ireland or England." He might have left out the qualitative "almost."

1. *Tail*, a tuft of orange floss; *body*, cinnamon coloured mohair, ribbed with fine silver twist; *hackle*, a coch-y-bondhu cock's, red, with a black list down the centre; *wing*, two strips of teal.

2. The same as No. 1, except that the body is half of scarlet and half of black mohair.

3. The same, save that the tail is made of slips from a golden pheasant tippet feather, and the body is in three compartments of yellow, scarlet and black mohair.

4. *Tail*, a small topping; *body*, bright yellow mohair, ribbed with narrow gold tinsel; *hackle*, at shoulder, ginger cock's; *wing*, two tippet feathers as long as the body, slips of light mallard over, not the brown scapular feather, but the silvery grey mottled one. This fly used to be considered indispensable in the rivers and lochs of Knoydart,

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but revolutionary notions may have dethroned it since the years—now far, far away—when it used to bring me splendid sport in that delicious country.

5. *Polly Perkins.* A Welsh sewin pattern. *Tag*, gold twist; *tail*, tippet fibres; *body*, peacock herl (fine bronze chenille better); *hackle*, at shoulder coch-y-bondhu; wing, two small peacock feathers, small blue chatterer cheeks: blue macaw horns.

6. *An Irish pattern.* *Tag*, silver tinsel and light orange floss; *tail*, a small topping and blue chatterer; *body*, blue mohair of rather a light shade; *hackle*, at shoulder, bright blue; *wing*, two of the blue barred feathers of a jay

7. *The Harlequin.* Mr. Ashley Dodd's pattern, *tail*, a whisk of teal; body, half orange and half apple-green floss, ribbed with silver wire; *hackle* at shoulder, black cock's; *wing*, slices of starling's wing feather.

Now, if the publishers were clamouring for "copy," this modest catalogue might be extended to an indefinite length, but it would be sheer humbug to do so. The angler who ties his own flies may perceive, by following the prescriptions above, the sort of thing that is required; and, selecting hooks varying from 8 to 4 in the Limerick scale, may indulge his fancy in devising attractive combinations. He who does not "busk" for himself, either, as is the nature of some, because his fingers are all thumbs, or because he has not time for it, can be supplied with excellent sea-trout flies by any good tackle-maker. No tradesman with a reputation to lose will sell him treacherous gut or badly-tempered hooks, and these are the two materials of prime importance. The rest is more

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or less moonshine. But there is one respect in which the common practice is distinctly at fault. The fly-book is such a handy contrivance that it may be futile to warn fishermen against its obvious defect, as I have already done in respect to salmon flies. It is just as injurious to trout flies. When flies leave the dresser's hands they are comely and buxom; wool bodies are neatly cylindrical, and hackles stand out uniformly all round. But no sooner are they stowed in the slips of a fly-book, than they become flattened like flowers in a herbarium; the fibres all lie in one plane, and, to all intent and purpose, a flat pattern cut out of leather or cloth would be as effective as the delicate simulacrum which has been composed with so much care. It costs a good deal more trouble to carry flies in tin boxes, where they will not be squeezed out of contour, but assuredly the trouble is worth taking; because it is much easier to persuade a fish that your make-believe is a living creature, if it retains a life-like roundness of outline. The trouble may be reduced to a minimum by choosing half-a-dozen different patterns—light, dark, and medium—in different sizes, and sticking to them. You can then carry the three classes in separate tins, and will be saved all worry about choosing the likeliest out of a hundred different kinds.

Defects of the fly-book

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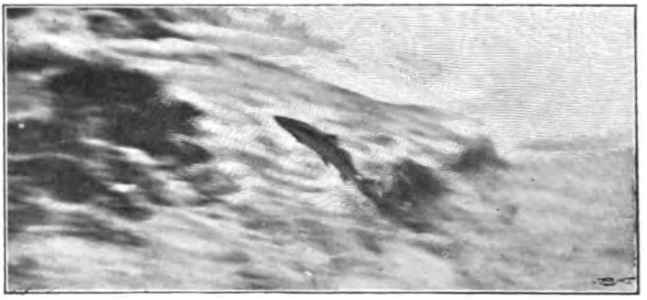

THE ASCENT.
(A snap-shot on the Shin).

CHAPTER IX

NATURAL HISTORY OF THE SALMON

"THE nonsense about the salmon that has been published under the name of natural history, and thrust down the throats of Parliamentary Committees, is, when looked back upon, appalling in amount, variety and worthlessness. To read some people's deliverances on the subject, they might seem to have collected their materials during a lengthened subaqueous residence, and to have come back speaking with a more than earthly authority. . . . In questions regarding the natural history of the salmon, it will almost always be found, except with regard to one or two points, settled by adequate experiment, that those people who have seen most are inclined to say least, and that those who have thought most are most at a loss what to think." [1]

The ordinary lifetime of a generation has passed away since these sentences were penned by one who presented the rare combination of an ardent sportsman, a cautious student of nature, and a versatile and humorous writer; and although to this day there remains certainly plenty of ignorance,

[1] *The Salmon*, by Alexander Russell, Edinburgh, 1864.

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plenty of groundless assertion and wild credulity afloat about the habits of salmon and the means to be taken for their encouragement, yet careful study by biological students and the experience gained in artificial hatcheries have contributed to dispel many illusions which formerly prevailed even among scientific men.

It is not many years since it was hardly possible to make any statement about fish of the salmon kind which would not be indignantly contradicted by somebody else. Once, indeed, a certain witness, with characteristic Scottish caution, did enunciate a proposition before a committee of the House of Lords which it would be very hard for any one to dispute. Asked to relate his experience of the salmon fisheries in his district (I think it was Aberdeenshire) he cleared the ground by the following remarkable preliminary statement:

"My lords and gentlemen, it's a weel kent fac' in oor country, that where there's nae watter there can be nae fush."

Well, assuming the presence of water, the difficulty of observing the life history of British fish of the salmon tribe has been largely increased by the tendency of some zoologists to confer specific rank on local varieties. This has been carried to a ridiculous extent with fresh water trout; but the experience of pisciculturists of recent years has brought about a reaction in opinion on this point, and the various forms of brook, lake and estuarine trout, including the Irish gillaroo, the great lake trout, the Scottish *ferox* and the Loch Leven strain, are generally regarded as one and the same species. Migratory fish of the salmon tribe have not been the subject of so much confusion, though consider-

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able uncertainty still prevails regarding the different kinds of sea trout.

Probably we shall not be far wrong in admitting four species of anadromous [1] British salmonoids.

1. *Salmo salar*, the Atlantic salmon, known as such in the adult form, in the adolescent form as a grilse, and in the immature forms of smolt and parr.

2. *Salmo trutta*, the salmon or white trout, known in the adolescent form as finnocks or whiting, and in the immature forms as smolt and parr.

3. *Salmo cambricus* or *eriox*, the bull trout (called "sewin" in Wales and "sea trout" in the Tweed).[2]

4 *Osmerus eperlanus*, the smelt, of no importance to anglers, but a true salmonoid, ascending the estuaries in spring to spawn at the highest limit of the tide.

The species of greatest importance, whether commercially or from the sportsman's point of view

The salmon

is the salmon (*Salmo salar*), which, owing to its size, perfect shape and general constancy to a single form, may be regarded as the type of the whole family of *Salmonidæ*. It is not necessary in a work of this nature to enter upon a minute anatomical and physiological description of the salmon, especially as this would

[1] Migratory, in the sense of resorting to the sea to feed, and to the fresh water to spawn and possibly also for repose and shelter.

[2] Dr. Day considered salmon trout (*S. trutta*) and bull trout (*S. eriox*, or, as he prefered, *cambricus*) to be no more than varieties of the same species; the salmon trout proper being the northern form and the bull trout or sewin the southern form. But they often frequent the same rivers, and, from a sportsman's point of view, are so different in their habits and appearance as to be conveniently ranked as separate species.

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be written not from personal observation, but as extracts from scientific treatises; but certain peculiarities in the structure of this fish may be mentioned as being of interest to sportsmen.

Like all other members of this family, the salmon possesses a distinctive feature in what is called the adipose or dead fin on the back, between the rayed dorsal fin and the tail. It appears to be the degenerated form of an active organ; if removed, the fish neither suffers inconvenience in health nor is its position in the water affected. But Dr. Day reported experiments to show that none of the other fins can be cut off without serious consequences.

"Should both the anal and dorsal fins be removed, the fish rolls from side to side: if one pectoral is cut off, it falls over to the side from which such has been taken: if both are abstracted, the head sinks: should the pectoral and ventral of one side be gone, equilibrium is lost: while removal of the tail fin interferes with progression."[1]

The adipose fin, therefore, serves only as the badge of the family. It is merely an envelope of thick skin, containing cartilaginous and adipose or fatty matter.

The skeleton of the salmon possesses certain characteristics which, by imparting great mobility to the spinal column and special aptitude to the caudal fin as the organ of propulsion, deserve the attention of anglers, as the chief cause of the peculiar activity of this fish. In common with those of other teleosteal fish, the vertebræ of the spine of the salmon are concave at either end; the cavities thus caused between the surfaces of contiguous vertebræ are filled with a gelatinous mass,

[1] *British and Irish Salmonidæ*, p. 13.

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retained in its place by the connecting ligaments (Fig. 50). Consequently, between the vertebræ are elastic balls of semifluid consistence, which enables them to move freely upon one another.[1]

The upper surface of each vertebra is protected by two bones which, joining to form what is called the neural arch, are prolonged into the neural spine (Fig. 51). Besides these, from each vertebra spring outwards and upwards two bones, one on either

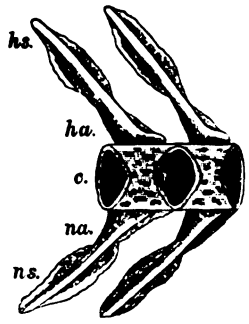

FIG. 50.—SECTION OF TWO CAUDAL VERTEBRÆ OF A SALMON.

c, centrum; *ha*, hæmal arch; *hs*, hæmal spine; *na*, neural arch; *ns*, neural spine.

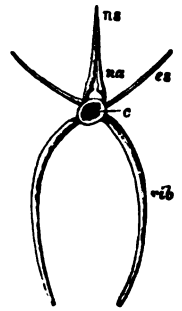

FIG. 51.—ABDOMINAL VERTEBRA OF SALMON.

c, centrum or body; *na*, neural arch; *ns*, neural spine: *es*, epipleural spine.

side, known as the epipleural spines, as well as two ribs which descend to enclose the ventral cavity. But there is a modification of this structure in the vertebræ near to and forming the tail. The neural arches and spine continue, but the epipleural spines disappear, and the ribs coalesce to form a second series of arches and spines, termed the hæmal processes, by which the blood-vessels are protected (Fig. 52). A further change takes place in the last four or five caudal vertebræ, which are deflected

[1] *British and Irish Salmonidæ*, p. 14.

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upwards. The hæmal processes become enlarged and flattened, and are distinguished by anatomists

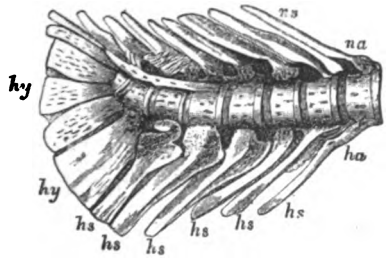

FIG. 52.—HIND END OF VERTEBRAL COLUMN OF A SALMON.
ha, hæmal arch; *hs*, hæmal spines; *hy*, hypusal bones; *na*, neural arch; *ns*, neural spine.

as the hypural bones. Their function is to support the caudal fin—the sole engine of locomotion. The last caudal vertebra is very small and articulates

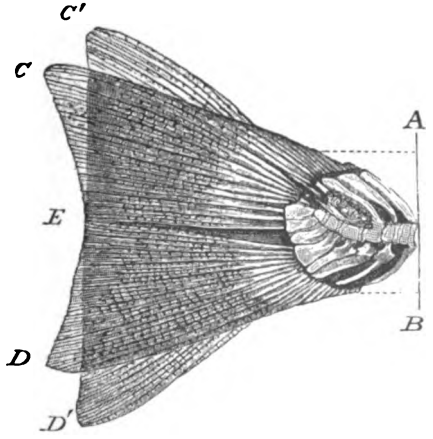

FIG. 53.—CAUDAL FIN OF A SEA-TROUT, EXPANDED HALF AND TWO-THIRDS.

with a fan-shaped bone. It will be seen on reference to Figs. 52 and 53 that this arrangement imparts

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peculiar activity to the tail, which responds effectively to the movements of the flexible spine caused by the powerful masses of muscle in the anterior parts. It is this structure that gives the salmon family such an unrivalled reputation as "game" fish.

In these observations it has been attempted to convey a brief summary of the most important structural characteristics of salmonoid fish, as explained by authorities in anatomy; but when we go on to consider and speculate on the origin of salmonoid species, we are very apt to find ourselves at sea, in a figurative, as well as in a literal, sense. Still, the industry of pisciculture, or the artificial propagation of fish, has revealed so much that was before obscure, and suggested so much more than had been suspected previously, that one ought not to shrink from facing some of the conclusions to which scientific opinion seems to be moving cautiously. When it is remembered that little more than a generation has passed away since the results of careful and repeated experiments by Mr. Shaw, the Duke of Buccleuch's head keeper at Drumlanrig on the Nith, and the systematic hatching of thousands of yóung salmon at Stormontfield on the Tay, had convinced most people that the parr was not a separate species, but the young of the salmon, one cannot afford to be impatient with the slowness in the advance of accurate knowledge. As late as 1864, Alexander Russell was obliged to devote a good deal of his excellent volume *The Salmon* to argument for the benefit, as he says, "of a considerable number of people who, instead of having been convinced, have only been enraged."

That controversy, however, has been for ever laid

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to rest; though others have arisen, scarcely capable of such easy demonstration.

Hardly had the parr been proved conclusively to be the young of the salmon than the remarkable resemblance between parr and young trout suggested the problem of a common origin. The study of embryology, atavism, evolution and the origin of species has been going on steadily in the interval, but as yet it is impossible to report any common agreement as to the pedigree of the various British salmonoids. But when we consider the peculiarly plastic nature of common trout—how various are the forms, colours and dimensions imparted to different members of the same brood by conditions of water, soil, and food—how the most favourable combination of these conditions tends to produce the salmon-like properties of silvery scales and ruddy flesh—the suggestion is almost irresistible that salmon, sea and brook trout have scarcely acquired the degree of differences necessary to constitute independent species. This suggestion is strengthened into a strong impression by the result of experiments in hybridising conducted at Sir James Gibson Maitland's fish hatchery at Howietoun. Not only has it been ascertained to be possible to obtain hybrids between salmon and Loch Leven trout and sea-trout and fresh water trout, but such hybrids have themselves proved fertile, and progeny has been reared from their ova.[1] It is true that the percentage of losses among hybrid eggs of salmon and river trout during incubation is generally far higher than among the eggs of homogeneous parents; but, as Dr. Day pointed out, this is probably owing to mechanical causes, "the

[1] *British and Irish Salmonidæ*, p. 270, *et passim.*

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micropyle in the trout ova being of barely sufficient extent to admit the spermatozoa of salmon, but, owing to the large size of the eggs of these trout at Howietoun, this difficulty has been partly overcome."[1] A kindred difficulty would have to be encountered in the attempt to impregnate a Shetland pony mare by a Clydesdale stallion, yet no one will question the identity of species in two such dissimilar individuals. The greater mortality among hybrid alevins, or the fry obtained from the union of salmon and trout is not so easily explained.

But the hybrid ova of sea trout and river trout are just as fertile as those of a single species, and the offspring are vigorous and prolific.

Supposing, then, that a common ancestry be assumed for migratory or marine and stationary or fresh water salmonoids—what were the circumstances which caused the progeny to adopt such different habits as to cause the establishment of practically independent species? Was the common ancestor of marine or fresh water habitat? Pennant (1776), Fleming (1828), Parnell (1838), Frank Buckland and other writers on the salmon, agreed in assigning to the species a pelagic origin, relying principally on the incontestible fact that from the moment it leaves the sea to enter the fresh water, it begins to deteriorate in condition. Dr. Günther, on the other hand, describes the genus *Salmo* as "inhabitants of the fresh waters of the Arctic and temperate parts of the Northern hemisphere, many species descending to the sea after depositing their spawn." (*B. M. Catalogue*, vi. p. 3, 1866).

Since this opinion was expressed an interesting

[1] *British and Irish Salmonidæ*, p. 267.

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and suggestive light has been thrown on the tendency of the British brook trout to resort to the sea. Various rivers in Australasia have been stocked successfully with *Salmo fario* from Great Britain. In Tasmania, the large trout are only found in the river Leith during the winter months, when they seek the spawning beds. For the remaining nine months they are either in the estuary or in the sea itself. Indeed, they have been taken of large size in nets in the bay. In some of the rivers of New Zealand the trout caught previous to 1878 were marked with red spots like their English relatives; they have now completely lost this distinction, and have become as silvery as salmon with the characteristic X-shaped spots of the migratory species.

Here we seem to witness a repetition of what took place in the primitive rivers of a remote age. Certain members of the ancestral salmonoid population of these waters, probably the more robust individuals, requiring more food than their native streams supplied, and more enterprising in the search for it, wandered into the estuaries and into the surrounding sea, where they found exceeding abundance. After sojourning there and rapidly increasing in size under the stimulus of plentiful nutrition, their tissues became so fully stored with nitrogenous, adipose, albuminous and other matter, that the appetite for food diminished or entirely ceased. But the seasonal sexual appetite ensuing, they obeyed the common instinct of other vertebrate animals, and returned *home* to reproduce their species. One of the phenomena on which the advocates of the polar origin of life rely most confidently is the known tendency, invincible,

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immutable, of all birds to breed at the northernmost limit of their annual migration. So strong is the impulse of certain birds to return at the nesting season to their ancestral home, that their eggs have not been found, being laid so far north that they have been hitherto beyond the reach of travellers. But the salmon has an additional and more imperative reason for returning to its native fresh water to breed. Salt water has been proved to be fatal to the vitality of the ova. Mr. Hogarth made the experiment in 1824 with ova taken from the Don; Mr. Sinclair made similar experiments in Ireland in 1862 with eyed ova; in these, and in other instances which might be quoted, the result has been invariably to destroy vitality. It is true that salmon are known to cast their spawn sometimes in salt or brackish water where it perishes, but only at the mouths of such small streams as the fish are unable to enter except in periods of flood. So also sea trout confined in salt water in the Southport aquarium have been seen to shed their ova, which were immediately eaten by their companions.[1] But such are instances of abnormal, even morbid, behaviour, performed under stress of adverse circumstances, and it is difficult to understand how so many students of the life history of the salmon have failed to recognise that the necessity of resorting to fresh water for reproduction, points to fresh water as the natural and original habitat of the genus and to the sea as its occasional resort and feeding ground.

There is a converse example of acquired anadromous habits in the case of eels. The reproductive operations of the eel were a complete

[1] Mr. Jackson, in *Land and Water*, 10th June, 1876.

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mystery until, quite recently, Professor Grassi of Rome succeeded in solving the problem by a series of observations conducted in the Straits of Messina. It was known, indeed, that eels descended to the sea to spawn, but their spawn and the larval forms issuing from it remained undiscovered until Professor Grassi carefully analysed the various creatures thrown ashore from a great depth by the strong currents in the Straits—the classical Scylla and Charybdis. Female fresh water eels ready to spawn and males full of milt were obtained, as well as floating eggs, larval and post-larval forms. The post-larval forms had been previously regarded as a distinct and adult species, and had received the title *Leptocephalus brevirostris*, just as the older writers classified salmon parr and young sea trout as *Salmulus*. Professor Grassi proved that they were merely young of the fresh water eel (*Anguilla vulgaris*).

The migration of eels.

Now it is very doubtful if eels which have once descended to the sea ever return again to fresh water. If they do so, it is in small numbers and at irregular times; therefore eel weirs, unlike salmon traps, are invariably set to intercept *descending* fish. It would therefore seem reasonable to regard the sea as the native habitat of the eel, whence the fry migrate once soon after hatching, returning, after an indefinite number of seasons, to reproduce themselves in their primeval home, which they never leave again. Salmon, on the other hand, are descended of a fresh water ancestry, but have acquired that force of habit which is indistinguishable from instinct, impelling them to seek the salt water for their favourite and necessary food, and

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causing them to return home annually as soon as that purpose is accomplished, to conduct the operations of reproduction. No philosopher has succeeded in defining a difference between hereditary habit and instinct, but it is admitted that what we vaguely term instinct is among the least controllable forces in the nature of animals. Consequently it is not surprising to find that the migratory instinct is so strong in the salmon, that being a high couraged fish, it will often sacrifice its life in the attempt to obey the impulse. Mr. W. Brown has put it on record that, having taken eighteen parr from the Tay in February, 1836, he confined them till May following, by which time they had acquired the silvery livery of smolts. But so impatient were they to be gone that some of them leapt out of the pond and perished on its banks. Similarly, salmon and grilse ascending from the sea will throw themselves repeatedly against almost unsurpassable obstacles, injuring themselves on rocks and sometimes throwing away their lives in their desperate—almost pathetic—attempts to get to the head waters.

I have watched them for hours at the Linn of Glencaird, about twelve miles from the sea, on the Minnick, a tributary of the Cree. About a mile below the fall at the Linn, the Minnick is joined by the Trool burn, a stream of considerable volume (of greater volume, indeed, than the upper reaches of the Minnick, to which the fish seem so anxious to attain), apparently of equal excellence to the Minnick as a spawning ground, and with no obstacle whatever to such fish as chose to enter it. Strange to say, nearly every salmon and grilse passes by this easy passage and presses on to the

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SALMON LEAPING AT A FALL.

[*To face p.* 222

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assault of the Linn. Hardly one attempt in twenty is successful. Before a fish can get into the trough through which he can swim to the upper channel, he must surmount a vertical and heavy fall of about five feet; he must then cling to the slippery rocks by means of ventral and pectoral fins and wriggle himself upwards through broken and shallow water. Over and over again fish fail to get over the sheer fall; over and over again, when they have done so, they fail to retain their hold on the rocks, and are swept back again, yet they return again and again with perseverance which seems indomitable.

Land-locked salmon

Now, in support of the belief that salmon are indigenous, not to the sea, but to fresh water, the peculiar circumstances must be taken into account of the Canadian ouananiche, which is the same as the so-called "land-locked salmon" of Lake Maine in the United States, and Lake Wenern in Sweden. There is an overwhelming mass of opinion among scientific men that this fish is specifically identical with *Salmo salar*, the Atlantic salmon, from which it differs solely in that it never visits the sea.[1] The epithet "land-locked" is most misleading and ought to be discontinued. It is easy enough to find obstacles sufficient to prevent salmon ascending a river, but it is impossible to say what must be the height of a fall that will prevent them going to the sea if they desire to do so. In Labrador ouananiche are found above falls more than one hundred feet in height, and it is possible that fish might be dashed to pieces in descending them. But even if

[1] Report of the Commissioners of Fisheries, Game and Forests of the State of New York, 1896, pp. 21 and 145.

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it were conceded that a geological convulsion had so dislocated the strata after the ascent of salmon into the head waters as to prevent any subsequent ascent, what prescience has prevented those already in the lakes from descending by the same channel which they came up? Can a salmon gauge the height of a cascade which he wishes to descend? If he can, has he the power of calculating—"Hm! thirty feet—a nasty drop—but still, I think I can do it, so here goes!" Or again, "Oh, Moses! look here—one hundred and seven feet of a fall, as I'm a scaly sinner. Not for Joseph! I must just put up with inland quarters for the rest of my time."

This looks absurd enough in print, but is there anything less absurd involved in the theory of salmon becoming land-locked? And if anything were needed to render the argument untenable it is the presence of large numbers of ouananiche in the Canadian Lake St. John, whence there exists access to the sea without any obstruction whatever.

Further and better acquaintance with the crustacean and other forms of life in waters inhabited by true but non-migratory salmon will probably show that these fish have never acquired the sea-going habit, because their native waters produce food in such abundance and of such quality as suffices for the maintenance of the most robust type of salmonoid. The ouananiche treats these great inland sheets of fresh water as the migratory salmon does the sea—namely, as a place of pasture and recreation—and he enters the streams flowing into the lakes for spawning purposes.

This question of the origin and ancestry of the salmon may seem to be one which the sportsman can afford to treat with indifference. So long as

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he has access to well-stocked rivers, he may not care to speculate on the remote origin of the fish which affords him so much delight. "Where," not "what" or "whence are salmon?" is what he wants to know. Well, he is at liberty to skip as much of this chapter as he pleases; but it is of some advantage to a man to understand as much as possible of the nature and habits of the animal he designs to pursue, especially when its capture is to be effected not by shooting or hunting, but by inducing it to seize a bait.

For example, if the salmon fisher holds the opinion that salmon resort to the sea for the purpose of seeking food, that they find it there in such abundance and partake so freely of it that they re-enter the fresh water prepared for, and even disposed to, long periods of practical abstinence, then he will be more inclined to excite the curiosity, the pugnacity, the irritability or the playfulness of the fish, than appeal to its sense of hunger. But still more important is it that salmon fishers in general should understand something of the life history of salmon, in order that they may promote or undertake those measures for the replenishment of depleted waters and for the improvement of the stock in other waters, which, though undreamt of fifty years ago, are now rightly considered essential to the maintenance of our fisheries. Very little, it may almost be said nothing, is understood of what causes salmon to enter some rivers early in the year and others late. Speculation and observation have been baffled alike in the attempt to define the conditions requisite to attract spring salmon. Temperature of the water has been assigned confidently as one

Early and late rivers

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cause, assuming that fish would enter a warm current more readily in winter than a cold one. But this is incompatible with the well-known fact that the rivers of Sutherland and Caithness are among the earliest in the United Kingdom. The Thurso, depending for its volume entirely on melted snow, draws fish from the sea all through the winter months. The annual close season ends on 11th January, and if the river is not frozen hard across, as very often is the case at that period of the year, good sport may be had with large flies. At the other end of Scotland is the Annan, a river at least equal in size to the Thurso, where no clean fish are to be caught till June, although the Eden a few miles on one side and the Kirkcudbrightshire Dee a few miles on the other are both very productive in March and April.

Still more remarkable is the contrast in this respect between the Bush and the Bann, which flow into the sea within a few miles of each other on the north coast of Ireland. The Bann is a fine, sweeping stream, flowing from a great inland reservoir, Lough Neagh, and no salmon shows his nose in it till June. The Bush, on the other hand, a dirty little ditch across which, so to speak, you may kick your hat in any part, is a good spring river, beginning in February, and affording the best sport in April.

Different habits of different races

There is much reason to believe that the earliness or lateness of a salmon river depends not so much on the nature of the water or its channel, as on the hereditary peculiarities of the race of fish frequenting it. It is certainly possible to modify by artificial means the habits of salmon in a river. When Mr. Dunbar took the Thurso fisheries in hand, that river had

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the reputation of being the earliest in the United Kingdom, but the autumn angling was of hardly any account. The fish were exceedingly abundant in the winter and spring months. In 1863 there were killed before the end of May with rod and line no fewer than 1,510 salmon and grilse, weighing 14,666½ lbs. distributed as follows :—

February	206 fish
March	317 „
April	290 „
May	697 „

Twice in that year a single rod took seventeen, and twice fifteen, salmon in one day.[1] Probably this record of spring angling has never been equalled in British waters.

But the native Thurso fish is said to have been lanky and unhandsome, wherefore Mr. Dunbar resolved to introduce a better strain. He got spawn from the Tay and other rivers, and succeeded so completely that Thurso salmon are now inferior to none in appearance and quality. But in proportion as the quality of the stock improved, so did the river lose its superiority as an extremely early water. Taking the quinquennial periods between 1863 and 1887 the *average annual* number of fish per month to the six rods appears as follows :—

	Jan. and Feb.	March.	April.	May.
1863–77 . .	70	159	213	271
1868–72 . . .	74	164	297	226
1873–77 . . .	57	144	319	223
1878–82 . . .	41	102	231	104
1883–87 . . .	45	73	235	137

[1] This score was exceeded in 1874, by the capture of twenty-one fish in a day to a single rod.

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Subsequent years exhibit a still further falling off in the returns for February and March,[1] although the autumn fishing, formerly of little value, is now excellent.

The average weight of fish in the Thurso shows a slight increase, though this is perhaps attributable to the preservation of kelts.

1853–57	average	weight	10·21 lbs.
1858–62	„	„	9·88 lbs.
1863–67	„	„	9·79 lbs.
1868–72	„	„	10·54 lbs.
1873–77	„	„	11·47 lbs.
1878–83	„	„	11·83 lbs.
1883–87	„	„	10·99 lbs.

There has been an additional circumstance which may be considered as contributing to the falling off in the numbers of early fish. A hatchery has been maintained for many years at Brawl Castle, four or five miles above the tideway, and it has been the custom to take spawn to supply the boxes from fish netted in the lower reaches of the river, as being conveniently at hand. Now the fish in these reaches would naturally be the latest running fish, and their seasonal habits would be transmitted to their progeny. By such means, if persevered in, it would seem possible greatly to deteriorate the early properties of a river, at the same time improving it as an autumn stream. Conversely, one might anticipate excellent results from the introduction of the spawn of early

[1] During the last three weeks of February of last year (1897), mild weather prevailed, and a splendid water for running fish, yet four rods fishing regularly only landed seven fish.

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running fish into rivers where, at present, there is no spring fishing.

Perhaps no river has benefited more conspicuously by judicious introduction of new stock than the Aberdeenshire Dee. Always an early water, the average weight of the fish some years ago was very small. Since spawn has been taken from heavy Tay fish, not only has the autumn angling greatly improved, but the average weight shows a very marked increase.

In endeavouring to solve the secret which lies at the back of earliness or lateness in rivers, one must be prepared to encounter with patience a great deal of local opinion at variance with what seem to to be the true conclusions. At such a place as Ayr, for example, one might find the fishermen strongly wedded to the view which is often entertained elsewhere, that rivers running out of large lakes will prove early waters, and those with no lakes at their source late ones. Ayr is situated between the river Ayr on the north and the river Doon on the south, the estuaries being not more than two miles apart. The Doon is supplied from Loch Doon, a large and deep sheet of water; and it is a good spring river. The Ayr, on the other hand, takes its rise in no lake, and is a late river, containing no salmon before midsummer. The striking physical contrast in the origin of the two rivers offers a very plausible explanation of their seasonal difference, to those, at least, who base their deductions on purely local phenomena. But the above quoted case, almost exactly converse, of the Bush and the Bann, on the Irish coast immediately opposite Ayr, shows how unsafe it is to draw conclusions except from a

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wide collection of material on which to found them.

Early and late runs of fish

In all rivers where netting, obstruction or pollution have not brought salmon nearly to extermination there are well known "runs" at regular seasons, differing from each other in the general character of the fish.

Winter fish

First of all there is in many rivers a run of heavy fish during the winter months. In the Thurso, where the open season for rod-fishing closes on September 14th, these fish are sometimes seen passing up as early as the end of that month. They usually run large, from 15 lbs. to 25 lbs., and they do not enter the river for the purpose of spawning that season, for, unlike the "grey schule" of the Tweed, their ovaries are never in an advanced condition. Mr. Dunbar claimed to have ascertained that these fish return to the sea during the following spring, and stated that he had caught them descending by stretching a net across the river. Be that as it may (it is still extremely uncertain), these are a very desirable class of fish to encourage in a river. Apart from their great average weight, they are of excellent quality; for although they get a coppery tinge after some weeks in the fresh water, their flesh is far better and firmer than that of the run of smaller fish which follow them.

Now what causes these fish to leave the sea, which some people consider their home, at a time when they have no intention of spawning—eight, nine or ten months before a single pair of fish will be seen on the redds? That they do leave it in considerable numbers, let the following incident testify

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During the abnormally mild winter of 1895–6 a large number of fish entered the Thurso, and good sport was obtained in the latter half of January. But with the beginning of February set in a spell of dry, very bright weather: little or no snow had fallen to keep the river up, and it fell to summer level. Under these circumstances no devices prevailed to induce salmon to take the fly, though numbers of them were rolling about in the pools. Weary of hopeless toil, a friend of mine took the fancy to go up to Loch More, which it is not usual to fish before the end of March, to see whether there were any fish up there. He walked across the moor, reaching the loch about three o'clock on a February afternoon, succeeded in launching a boat, and by half-past four had landed four of these heavy winter fish.

What are these salmon doing in this loch, distant more than twenty miles from the sea, at that season? If the sea be their home, why do they leave the abundance there for the hungry inland waters? The impression on my mind is very strong that in this phenomenon is revealed a great deal of the secret history of the salmon.

It is pretty generally believed by fishermen that many salmon do not mature spawn every year.[1] These heavy winter fish, then, which are so marked a feature in many rivers, are probably those fish which, had their ova and milt matured on the approach of autumn, would have entered the river with the spawning fish, and gone on the redds in the ordinary course. But as their generative organs did not prepare them for repro-

[1] *British and Irish Salmonidæ*, pp. 79 and 95.

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duction these "yeld"[1] fish continued feasting in the sea, until their whole frame was stuffed with nutriment, their appetite failed, and there was nothing to hinder them from returning home. Their return, possibly, was accelerated by a desire to escape from sea parasites and from seals, porpoises, dog fish and other persecutors.

They remain in the fresh water, slowly consuming the nutriment stored in their tissues, till such time as their appetite revives, and off they go again seawards, to return again for spawning purposes at the usual time.

So much for the first run of heavy fish. Now for the regular springers. In most rivers this run consists of small fish, rarely exceeding 12 lbs. and more commonly from 7 to 10 lbs. Why do they come up so many months before they can go on the redds? For precisely the same reason that actuated their elder brethren—repletion, desire for repose, and homesickness.

Spring fish

In May and June the grilse—the bachelors and spinsters which have never spawned—begin to leave the tide. At the same time, an increase may be observed in the average weight of the salmon which run during the summer months, until, in the autumn, the heaviest average weight of the year is attained. Doubtless among these heavy pregnant fish are the barren fish of the previous winter.

Grilse and summer fish

Autumn fish differ very greatly in colour and quality in many rivers. In some streams, there are few fish worth taking after the month of September. Apparently the oxidising properties of such waters are greater than those of

Autumn fish

[1] "Yeld," the Scottish shepherd's word for "barren."

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others; the silvery coats of the salmon become tarnished and unsightly, slime exudes from between the scales, and it is difficult to believe that these dark, ugly creatures are the same which, a few months before, were pictures of brilliant beauty. In other rivers again, the fish preserve their brightness even when they are far advanced in pregnancy.[1] The Tweed excels all other British rivers in this respect, and this specious appearance in its spawners has perhaps been the cause for the prolonged rod-fishing season in that stream. But the appearance is not much more than skin deep, and there can be no reasonable doubt that the open season ought to be curtailed by at least a fortnight.

Still, the experiment of improving the quality of late-running fish in those waters where they are inferior is one well worth trying, and one that might be undertaken with much confidence, seeing how successful it has proved in the Dee. Hitherto the general assumption has been that the earliness and lateness of rivers depended upon some undetected properties in the stream; but there seems good reason to accept Dr. Day's conclusion that the tendency to early or late ascent is inherent in fish of different strains or races, and can be controlled by careful management of fish hatcheries.

[1] See Appendix D, p. 264—"*Do salmon feed in fresh water?*" The result of the experiment referred to in the Report of the Scottish Fishery Board tends to show that the discoloration proceeds, not from the oxydising properties of fresh water, but from a derangement of the circulatory system.

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CHAPTER X

THE REPRODUCTION OF SALMON—NATURAL AND ARTIFICIAL

ALTHOUGH the opinion has been expressed in the last chapter that reproduction is not the only motive that causes salmon to ascend rivers, it is, nevertheless, not only the most obvious, but the most constant one ; and all who have the interests of a salmon fishery at heart should endeavour to secure the welfare and repose of the parents at the time of spawning.

The outward distinction of sex in both salmon and trout is very easily recognised. The snout of the male is far longer and the general appearance of the head much more powerful, and larger in proportion to the body, than that of the female. As the breeding season approaches, the extremity of the lower jaw of the male grows upwards into a peculiar hooked protuberance, of which the function is wholly unknown (Fig. 54). It can scarcely be defensive or offensive, for although it has a formidable appearance, the jaws are much more effective without it, and it often interferes with the mouth

The process of spawning

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being properly closed. The sides of the body lose the exquisite lustre of a new run fish and assume deep coppery, orange and brown hues. The female, on the other hand, does not usually suffer any change in the form of the head, though in exceptional cases she, too, develops a knob similar to that of the male.[1] Her scales receive an inky discoloration, blackish and purplish, very different from the ruddy tints of the male, and her belly becomes distended with spawn; whence the breeding she-fish is usually called a "baggit" in the North, and a "shedder" in some southern rivers.

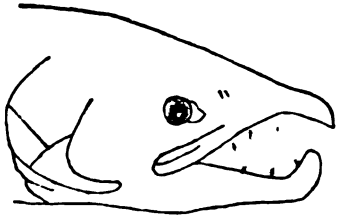

FIG. 54.—MALE SALMON IN THE BREEDING SEASON.

The breeding male fish is generally called a "kipper."[2]

The earliest spawners usually are observed on the breeding ground in the month of November: the female prepares the "redd" by laying herself on her side and fanning the gravel with her powerful tail into a kind of trough, while the male lies near her, taking no part in the proceedings, except, perhaps, to warn off intruders. Several days may be occupied in this operation, if the ova are not ripe for ejection, and they are days of

[1] J. Harvie Brown in *Zoologist*, May, 1886, p. 215.

[2] *I.e.*, a spawner, from the Dutch *kippen*, to hatch.

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exceeding great peril, because the redds are made in shallow water, and the fish offer a peculiarly tempting and easy prey to poachers.

The baggit deposits her eggs by instalments extending over eight or ten days, and after each laying the kipper sheds his milt over the ova. There are often two or more kippers attending a single female, and violent contests take place for the most favoured position. Scrope describes how the courtiers of a baggit in the Tweed were speared, one by one, on consecutive days. As each kipper was killed, his place was taken by a smaller fish, till at last one poor burn trout was all that remained to keep company with the large baggit.

The spawning season extends to the end of January, though even later than that an occasional baggit or kipper may be taken. Fish after spawning pass into the condition when they are known as kelts,[1] when they are protected by law as unseasonable. They are very voracious at this stage, and sometimes exercise the angler's patience as sorely as they worry his flies. There are not a few who advocate the destruction of kelts because of the destruction they work upon the young of their own species. No doubt they do kill a good many, but, as I have expressed the opinion elsewhere, not so many as they get credit for, owing to parr habitually frequenting shallower water than kelts care to venture into.

Salmon are exceedingly prolific; were it not for this the race must have become extinct long before this, owing to the numerous perils the young

[1] Other local names for kelts are "liggers" (southwest Scotland), "marks" (Caithness), "slats" (Ireland), "judies" (Kerry).

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must encounter in their progress to maturity. It has been reckoned that a baggit ought to contain 900 ova for every pound of her own dead weight, but Dr. Day mentioned at least one instance in which this proportion was much exceeded, that, namely, of a female salmon 20 lbs. in weight which contained 27,850 eggs.[1] It will be seen, therefore, that were fifty per cent. of the ova deposited to reach maturity, very few pairs of parent fish would suffice to stock a river of considerable size. But it is far otherwise. No sooner are the eggs deposited than they are liable to disturbance by floods or ice; numbers are devoured in the beds by aquatic larvæ, birds and eels—sources of loss which can be entirely excluded from artificial hatcheries. It has come to be recognised that the preservation of our over-fished rivers as sources of food and sport depends on the extent to which artificial reproduction is resorted to.

Growth of salmon from the egg

Now the art of rearing young fish of the salmon kind from ova stripped from the female fish and artifically fecundated by the milt of the male is a business of sufficient complexity and importance to fill a volume by itself. I would

A fish hatchery

[1] *British and Irish Salmonidæ*, p. 78. Large as this number is, it is far smaller than that contained in the roe of some other fish. Buckland found that in 7½ lb. of cod roe there were 6,867,000 ova. A 21 lb. cod contained 12 lb. of roe which would yield the prodigious sum of 11,000,000 eggs. A perch of 1½ lbs. contains from 20,000 to 28,000 ova; a mackerel of 1⅛ lb., 546,681. A brill of 4 lb. yielded 239,775; a plaice of 5 lbs. 144,600. A flounder weighing 1½ lb. gave 1,357,400 eggs, a sole of 1 lb. 134,000. A carp of 21½ lbs. contained 1,310,750 eggs, and one of only 16½ lbs. gave 2,059,750. Herrings contain from 20,000 to 30,000 each.

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refer those who contemplate undertaking it (and it is to be hoped in the interest of our salmon fisheries that there may be very many who do so) to Dr. Day's paper on the subject printed in vol. ii. of the *Fisheries' Exhibition Literature*,[1] and also to *An Angler's Paradise and how to obtain it*, by Mr. J. J. Armistead of the Solway Fish Hatchery.[2] But in the meantime, a short sketch of the process made partly from personal observation, but chiefly derived from conversation with experts and reading their published experience, may be attempted in this chapter, if it is only to show that, provided simple rules are scrupulously observed, there is no formidable difficulty in the undertaking, and no very complicated or expensive machinery required.

Its construction

The first point to be secured is an unfailing supply of water to the troughs which receive the spawn. Dr. Day recommended spring water, with a temperature ranging from 41° to 45°, and free from animal or vegetable organisms, and of course without pollution, as the best for hatching the eggs; but brook or river water, full of various forms of life, is essential for the young fish after they are hatched. In some districts, especially where the prevailing rocks are granitic, schistose, or primary, there is no difficulty in obtaining spring water almost or quite free from sediment; but in other places, especially in some lime-stone formations or on alluvium, the water deposits a sediment which is most injurious to the ova, and still more so to the young fry, by injuring

[1] London, 1884, William Clowes and Sons, Limited, by whose kind permission I am enabled to reproduce some of the figures in that work.

[2] Scarborough, *The Angler*, Limited, 1895.

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their breathing organs, and killing or deforming them. Such water should be led in pipes carefully protected from frost, preferably underground, from the spring, into a covered settling tank,[1] where the heavier sediment may be deposited, and then from the upper part of this tank into a filtering trough within the hatching-house, where it is made to pass through five or six flannel screens, fixed in wooden frames, fitted into grooves in the sides of the trough. These grooves should be cut at a considerable angle with the bottom of the trough, so as to hold the filters with their lower edges higher up the stream than their upper edges, which should be a couple of inches under the surface of the water, so as not to dam it back. From the filters, the water passes into a long supply trough, reaching right across the upper end of the hatching-house, whence it flows into the hatching-troughs.

Having secured a perennial supply of water preferably from a spring, and failing that from a stream, the next matter is the construction of the hatching-house at such a level as will permit easy ingress of water from the reservoir, and built, if possible, with such a slope in the floor as will allow a stair-like arrangement of boxes from one end of the house to the other (Fig. 55). The walls and roof of the house must be substantial enough to maintain a fairly even temperature within, and to exclude frost. The floor may be paved or concrete, with open gutters to run off waste water.

The hatching house

[1] A covered reservoir is almost indispensable, even where a settling tank is not required, to ensure a steady flow at all seasons, carefully regulated through pipes.

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Dr. Day recommended that the troughs be made of slate, stone, pottery or charred wood, with a guard of perforated zinc over the entrance and exit of the water, and the dimensions given by Mr. Armistead are 12 feet in length, 18 inches wide and 6 deep, with a board fixed across the inlet end at a moderate angle, reaching to within an inch of the bottom, so as tc break the force of the water entering. All wood in contact with the water should be charred to prevent

The hatching troughs

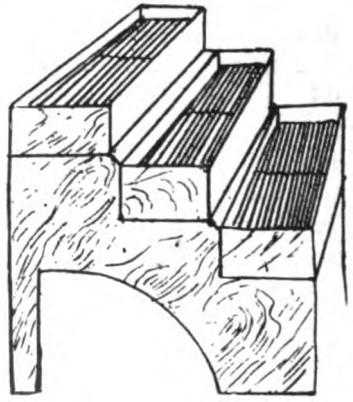

FIG. 55.—ARRANGEMENT OF HATCHING BOXES.

fungoid growth and to increase its durability. The charring wears off in time, and Mr. Armistead gives his boxes a coat of black varnish each season, which he finds equally effective. Each trough should be furnished with a light, loosely fitting or perforated lid, to exclude impurities, and also light, which is no advantage to the hatching of ova.

The old-fashioned method was to lay sifted gravel, well purified by scalding water, in the boxes to receive the ova ; but this plan has been discarded in

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most well-managed establishments in this country in favour of glass grilles (Fig. 56). Grilles to hold about 4,000 ova may be purchased for *4s. 6d.*

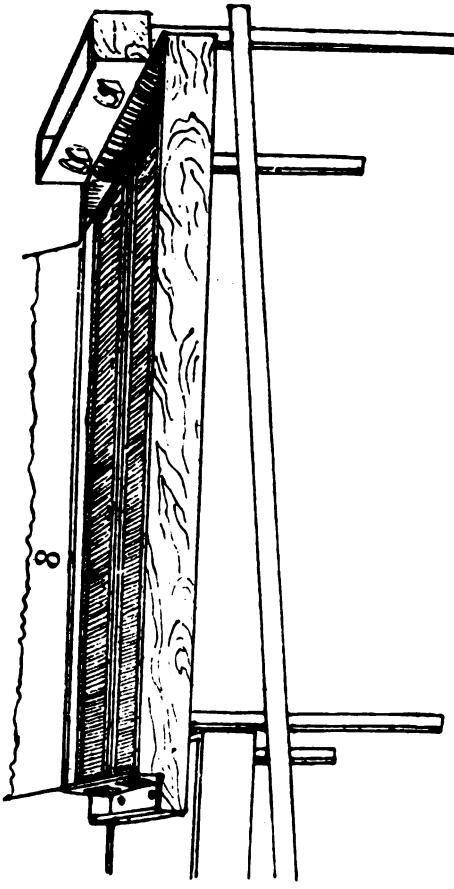

Fig. 56.—Glass Grilles to receive Spawn.

each. In the United States, where fish hatching is carried on with great success and diligence, trays of perforated zinc or wire are much used.

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Mr. Armistead lays much stress on placing a trap box below the outflow of the last box in each set, one side being made of perforated zinc to within an inch of the bottom. The object of this trap is to arrest any alevins or young fry that may be escaping. He says that it is a far more useful part of a hatchery than might be supposed, and his long experience makes the hint a valuable one. A bird in hand—a baby salmon in a hatching trough—is worth a good many ova laid in the open river. Mr. Armistead also says that he finds it pays him to cause the waste water flowing from the hatchery to form a long, narrow pool, in which he places all sickly, injured and apparently dying fry which have to be removed from the troughs. At the end of the season he is often surprised to find how many of these invalids have recovered and become useful fish.

The ponds

One or more ponds, according to the number of fry it is proposed to rear, must be constructed in which to receive the fry and maintain them until they are ready to depart to the sea. These may be formed by conducting a water supply, either through pipes or open courses, from the river to a suitable piece of ground. It is desirable, of course, that such nursery ponds should be within near view of the residence of the hatchery manager or some one assisting him ; but it is not always possible to manage this owing to the contours of the land.

If the ponds have to be constructed at more than a very moderate distance from human habitation, they must be protected by wire netting stretched on a stout framework, to exclude cormorants, herons, and even kingfishers. A single cormorant will devour

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an amazing amount of young fish in a very short space of time, especially if he finds that somebody has been thoughtful enough to confine them in a small space for his greater convenience.

Pond-making is rather a hazardous experiment for amateurs, not solely because of the danger of sudden inundation owing to the breaking of faulty embankments, though that cannot be left altogether out of account, but because it involves risk of disappointment and fruitless expense if it is undertaken without the advice of experienced persons.

A friend of my own, being a keen trout-fisher, having spent between £15,000 and £20,000 on a new and beautiful mansion house, desired to inundate a low-lying meadow in front of it so as to create an ornamental sheet of water. It seemed the simplest thing in the world to do this by throwing an embankment across the lower end of the depression and confining the waters of a rivulet which ran conveniently through it. Accordingly, the embankment was made; a pretty costly job it was, and, after all, it was a failure. Owing to the presence of porous beds in the subsoil, the water could not be retained, and the result was little more than the conversion of several acres of fine arable land into a marsh.

This was an example of failure owing to choice of a position where probably no amount of precaution or engineering skill would have availed to create a lake, but a commoner cause of failure arises from attempts to create ponds by throwing a dam across the course of a stream. For piscicultural purposes this should never be done, as it is sure to end in failure. It is absolutely necessary to retain complete control over the water supply to natural

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ponds. Flood water must be excluded at all hazards, else *débris* will be deposited which it is not easy to get rid of. One of two alternatives may be adopted. First, the course of the stream may be diverted, and the pond may be created by throwing a dam A A (Fig. 57) across the old channel B B. At the point E must be constructed a concrete chamber, covered with a grating, whence the supply pipe passes to the pond, the main stream running along the new course C C. If the stream is a small

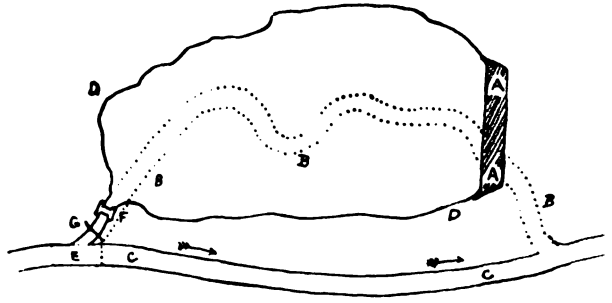

FIG. 57.—POND FORMED BY DIVERSION OF STREAM.

A A. Dam across old channel.
B B. Old channel.
C C. New channel.
D D. Pond.
E. Concrete chamber to regulate supply.
F. Sluice.
G. Screen.

one, this often will prove a less expensive operation than the second plan, viz., making a pond E E (Fig. 58) away from the existing channel A A, placing a low weir across the stream, and cutting a lead B B to supply the pond. The concrete chamber C C must be constructed on this lead, waste water finding its way down the new channel G. Of course the exit of samlets must be prevented whether up stream or down, by gratings. If the gratings are upright, the bars on them should be

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horizontal, but a better, though more expensive, plan is to cause the water to enter and leave through screens placed horizontally over the conduit pipes.

Before beginning operations, a visit should be paid to some good fish-hatching establishment, such as Howietoun or the Solway Fishery, where the principles of constructing rearing ponds may be understood far more easily than from written description.

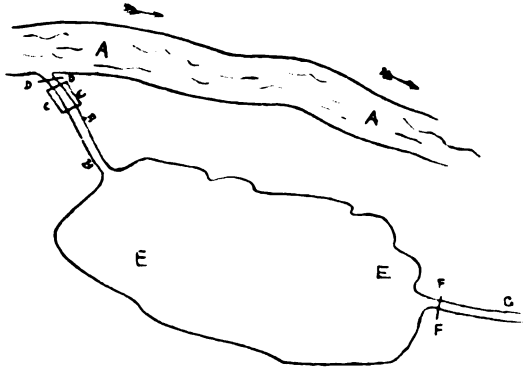

FIG. 58.—POND FORMED BY LEAD FROM RIVER.

A A. River.
B B. Lead.
C C. Concrete chamber to regulate supply.
D D. Screen.
E E. Pond.
F F. Grating.
G. Outlet for waste.

Obtaining and fertilising ova

The hatchery having been constructed and equipped, the next thing is to obtain eggs to stock it withal. Let me repeat here how important is the consideration, too often disregarded, what strain of salmon should be selected as parents. The whole character of a salmon river may be materially modified by the seasonal character of the fish which are taken. In spite of the obscurity still hanging over

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early and late running fish, it may almost be assumed that, in a river frequented both by spring and autumn salmon, the early running fish will be found on the redds farthest inland, and the late runners on those nearer the sea. If there is plenty of water in autumn, some late fish may certainly push far up the river before spawning, but no early fish will be found on the lowest redds.

Having captured a female salmon, pass the fingers gently down the abdomen, when, if she is ripe, a few ova will be emitted. She should then be carefully held between the knees, and all the contents of the ovary *which will pass freely* squeezed gently out into a shallow pan. A large fish struggles powerfully, and often requires two or three men to hold her during the operation. The ova of salmon are not, as a rule, all ready for extrusion at the same time. No attempt should be made to obtain any more than will pass freely; any ova that are forced out by violence are worthless, for they cannot be fecundated, and the parent fish will be seriously injured. No water should be placed in the pan that is to receive the ova; on the contrary, it should be thoroughly dried to ensure its cleanliness. When there is enough spawn in the pan nearly to cover the bottom, a male fish must be taken, and the milt pressed out over the ova, and gently mixed among them by the hand or by shaking the pan. Then water is poured in to the depth of two or three inches, and the pan is left still for half or three-quarters of an hour. At the end of that time, or, if the water temperature be less than 44° at the end of two hours, the ova will be found no longer adhering to each other or to the dish; but each egg has absorbed enough water to

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become a round elastic independent globe (Fig. 59). The ova are then to be turned out of the pans into a trough or tank with an ample current flowing through it, which, in half an hour, will have thoroughly cleansed them.

FIG. 59.—DETACHED OVA.

The next process is to take a measure, known to contain when full the exact number of eggs to fill a single grille in the hatching trough; then by counting the grilles filled in each day, an accurate record may be kept of the number of ova deposited in the hatching house.

The period of incubation of the ova of salmon varies according to the temperature of the water. One point requires special attention. Neither previous to nor after being placed on the grilles must the ova be suffered to receive the slightest pressure or concussion. Pressure results in deformed alevins; concussion, even comparatively slight, addles the eggs and destroys their vitality. Mr. Armistead mentions an instance of a tray of eggs getting accidentally shaken nine days after impregnation. The concussion was very slight, yet within a few days after 25 per cent. of these ova were picked off dead. Among rightly managed ova the percentage of loss from first to last is sometimes as low as 5 per cent.

Management during incubation

The period of incubation of the ova of salmon varies according to the temperature of the water. Dr. Day fixed the mean period in water kept at a temperature of 44·10 at seventy-seven days. Mr. Armistead says that, while salmon ova have been hatched in as little as thirty days, in very cold water in-

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cubation has been protracted to 160 days. The management of eggs in the grilles during this time, the punctual removal of such ova as their white opacity shows to be dead, the detection of fungus, and the use of different utensils necessary to enable the manager of a hatchery to perform his duties during this critical period, can hardly be learnt except by attendance at an establishment where the business is regularly taught. Amateurs or pisciculturists in a small way may demur at the expense of a trained attendant, but unless this is faced how can success in such a delicate business be reasonably hoped for? No man in his senses would dream of putting an ordinary labourer in charge of his vineries, or setting a gardener to look after his stable. Pisciculture is a craft requiring special technical instruction just as surely as agriculture or horticulture, but inasmuch as the business consists of a limited routine, the training need not be a prolonged one. A river proprietor who is able to net his own spawning fish, or receives permission from owners on other rivers to obtain spawn from theirs, will find it far more economical to pay good wages to a trained attendant, than either to employ one who has his business to learn, or to purchase salmon ova or fry from a commercial establishment.

It is not much use to aim at laying down less than 250,000 to 500,000 ova per annum, considering the risks through which the young fish must pass before they return as grilse. A very much larger number than this can be undertaken by a single trained attendant, though of course he will require assistance at netting and spawning time, but his wages would go a very short way in purchasing

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fertilised ova or fry from a professional pisciculturist. Persons who offer ova of various fish for sale have no difficulty in meeting to almost any extent the demand for the young of river trout, because they can keep an ample breeding stock on the premises. But they do not usually possess the means of supplying their boxes with salmon spawn, because they are not usually proprietors of salmon rivers, and those who do own such rivers are naturally unwilling to allow them to be depleted for the benefit of others. Indeed, it is not permissible under the existing salmon-fishery laws to take spawning salmon in order to supply the open market with eggs and young. Consequently, if any price at all were quotable for what is really a contraband article, it would be a very high one, and the supply extremely uncertain. The proper course is for a river proprietor, or a combination of proprietors, to take and rear ova from their own waters, under skilled management.

About half way through the period of incubation two minute dark dots appear in each ovum—the eyes of the future fish—a potential forty-pounder (Fig. 60). After this stage the vitality of the embryo is not nearly so susceptible of injury by shaking as at an earlier period. Eyed ova carefully packed may be sent considerable distances by rail and survive the transit. Various forms of transportation boxes are described in the *Fishery Exhibition Handbook*, 1884.

FIG. 60.—EYED OVA.

The next change is the appearance of a faint red streak indicating the vertebra, and the development of the embryo continues till the skin of the

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egg splits and the larva issues a transparent alevin with a large umbilical sac attached, as shown in Fig. 61. The newly hatched creatures slip down between the bars of the grilles, leaving the egg skins behind them, and when all the ova on a grille are seen to be hatched, the grille may be removed and the alevins allowed to pack together in the trough. Now is apparent the necessity for well-constructed boxes, in which there shall be no crevices into which the alevins may creep. If they do so they assuredly will die from suffocation. They must be kept in the fair current of water, though allowed to congregate there as closely as they will. In the course of the next few weeks the umbilical bag, which contains the nutriment necessary for the larva, is gradually absorbed until the young creature assumes the form of a perfect fish.

Management after hatching

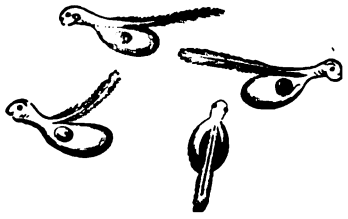

FIG. 61.—ALEVINS OR LARVAL SALMON.

Shortly before the disappearance of the umbilical sac is the right time to begin to give food to the fry. Mr. Armistead (whose experience has been chiefly with freshwater salmonoids) recommends raw liver which may be finely grated or chopped, and squeezed through fine perforated zinc. Or it may be treated by decanting—thus. Put a pound of grated liver into a gallon jar, fill up with water and stir it together. Let it settle for a few seconds and pour off the liquor, which will be full of minute fragments of liver. Fill up the jar again and

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decant in the same way. The residue does to feed the yearlings in the pond, while the liquor is decanted into pint bottles, and poured into the trough where the water enters. The fragments will be greedily taken by the fry, and care should be taken that all get an equal chance at the fare provided. Beef, yelk of hard-boiled eggs, and curds are employed also for feeding the fry at this stage.

After the umbilical sac has been absorbed and the fry have assumed the characteristic trout-like colouring of the parr, they soon become impatient of restraint and the time arrives to commit them to the nursery pond. Of course it is obvious that it would not be safe to turn them at this tender stage among the parr hatched the previous season. There must be at least two nurseries, one containing the brood of each year. Here they continue, regularly fed, till the following spring or summer, when most of them will be seen to undergo a further change. The characteristic parr markings fade, the yellow tinge on the flanks and the red spots on the sides disappear, and the whole fish, which by this time ought to be from 5 to 8 inches long, becomes silvery in its scales and gill coverings. It has become a smolt, and is not only ready for passing to the sea but exceedingly impatient if any obstacle is placed in its way. Numbers of young salmon have been lost by jumping out on the banks and perishing, because of neglect to afford them a free pass to the estuary.

Nursery ponds

The majority of parr leave the fresh water as yearlings—that is, some time between April and September in the year following their birth. But it is known that a considerable number delay departure till they are two years old; though the

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reason for this has not been ascertained. Their passage to the sea is accompanied by numerous perils. Now is the chance for seagulls of various sorts, which, during the descent of the smolts, may be seen mischievously busy, picking them out of the fords. Other bipeds there are, too, much to be dreaded; boys—ay, and grown men, who do not scruple to fill their baskets with these free-rising little fish, in waters where the police and bailiffs are not on the look-out. Pennant describes how in the Severn near Shrewsbury, "a skilful angler in a coracle will take from twelve to sixteen dozen in a day."[1] From 144 to 192 salmon in a day! what cruel extravagance. But the little fish were not known to be salmon at that time, for Yarrell, writing in 1836, remarked—"That the par is not the young of the salmon, or indeed of any other of the larger species of *Salmonidæ*, as still considered by some, is sufficiently obvious from the circumstance that pars by hundreds may be taken in the rivers all the summer, long after the fry of the year of the larger migratory species have gone down to the sea."[2] The spectacle of an industrious writer like Yarrell giving himself away in this manner, shows how cautious one ought to be in deduction from phenomena. They knew better in what we sometimes call the dark ages. In a proclamation issued by James IV. of Scotland for the regulation of justiciary circuits, among the "punctis of the ditte to be inquirit" is the following:—

"Item, gif thair be ony that slais rede fische (salmon) in orbodyn tyme, or *smoltis* in mill-dammis."

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[1] *British Zoology*, iii. p. 304.

[2] Yarrell's *British Fishes*, Ed. 1836, i. p. 15.

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But the fact is, Yarrell knew well enough and never disputed, that smolts, *i.e.*, parr that had acquired a silvery coat, were young salmon descending to the sea. What he failed to discern was the identity of smolts and parr. The missing link has now been revealed by the operations of pisciculture, and there should never be any more uncertainty on the subject. Unluckily, I have known, within the last few years, a keen and good sportsman, now no more, who used to fish regularly in spring for smolts, catching hundreds of them, which he maintained to be a distinct fish from salmon or sea-trout, ascending from the sea.

Well, having bid farewell to our smolts on their seaward journey, we expect to see no more of them till they return to the river as grilse. We don't want to encounter them, as Dr. Day did in 1882, in the stomach of a saythe taken at sea off Montrose. Some of them probably will re-appear the following summer, small grilse, from 2 lbs. to 5 lbs. weight. Then, as the season advances, heavier grilse from 6 lbs. to 10 lbs. put in an appearance,[1] which it puzzles most amateurs to distinguish from salmon. It puzzles *me*, I know; or rather, I refuse to be puzzled by it. I don't profess to be able to say with certainty of this 7 lb. fish that it is a salmon, and of that 10 lb. one that it is a grilse, but am quite prepared to take the fisherman's word for it.

[1] I mention 10 lbs. as the heaviest weight I have ever seen attained by a grilse. But Dr. Day quotes Mr. Anderson as estimating the August run of grilse in the Forth as varying from 8 lbs. to 16 lbs. Perhaps this is a misprint for 10 lbs. (*British and Irish Salmonidæ*, p. 71, note.)

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Various attempts have been made to account for the want of uniformity in grilse. Assuming the right definition of a grilse to be a salmon that has never spawned, some persons believe that all the salmon which enter a river in each season do not spawn—do not, indeed, enter the river for the purpose of spawning. Surfeited with sea diet and unable to stuff themselves any more, they return *home* for repose. Just so it is possible that all grilse may return to the river in the first year after they leave it as smolts, but some of them return to the sea without spawning and reappear the following summer, still grilse, but greatly increased in weight, and ready to spawn.

Others again, consider it improbable that a smolt weighing 4 or 5 ozs. can put on flesh so rapidly as to reappear twelve or fifteen months later as a grilse of 10 lbs. The small grilse from 2½ to about 5 lbs. may be no more than three years old, but the larger fellows are perhaps not less than four years old. It is unsatisfactory to have to employ so often the qualitative "perhaps" in respect of a subject which has already received so much careful attention; but it has not passed yet to a stage where suggestion may be exchanged for assertion. If any one were to drive me into a corner about it, I should feel obliged to resort to a delicious piece of circumlocution which I once heard from the mouth of a witness giving evidence (not for the first time, you may be sure) before a Parliamentary Committee. He had been asked a question to which he ought to have answered "I don't know"; but being unwilling to make such a compromising admission, he turned it thus: "The honourable

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member is now directing inquiry into matters, as to which personal cognisance on my part is a matter of impossibility."

And there, for the present, the matter of the grilse must be left.

THROUGH THE RAPIDS.
(A snap-shot on the Shin.)

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APPENDIX A

A STATEMENT showing since 1872 (the date of the formation of the DEE SALMON FISHING IMPROVEMENT ASSOCIATION [1]) the RENTAL of the SALMON FISHINGS in the DISTRICT of the RIVER DEE (distinguishing Net from Rod fishings), the AVERAGE PRICE per lb. of SALMON and GRILSE, and the WEIGHT of FISH CAUGHT at the SALMON FISHINGS belonging to the ABERDEEN HARBOUR COMMISSIONERS.

Year.	Rental.						Average price per lb. of		Weight in lbs. of fish caught at Aberdeen Harbour Commissioners' fishings.
	Net fishing.		Rod fishing.		Total.		Salmon.	Grilse.	
	£ s. d.		£ s. d.		£ s. d.		s. d.	s. d.	
1872	6,018 14 10		1,012 0 0		7,030 14 10		1 2½	10½	91,682
1873	5,782 14 10		1,119 0 0		6,901 14 10		1 7⅜	9¼	88,248
1874	5,630 12 10		1,354 0 0		6,984 12 10		1 7⅜	10⅜	118,924
1875	5,679 10 0		1,639 16 0		7,319 6 0		1 4½	11½	86,410
1876	6,997 10 10		1,900 2 0		8,897 12 10		2 2½	9⅜	78,143
1877	6,830 0 10		2,100 0 0		8,930 0 10		1 7½	9½	95,182
1878	5,978 0 10		2,295 10 0		8,273 10 10		1 2½	1 2	137,307
1879	6,267 0 10		2,873 0 0		9,140 0 10		2 0½	1 1	56,890
1880	6,826 0 10		3,115 15 0		9,941 15 10		1 3	11½	71,430
1881	6 374 0 10		3,483 10 0		9,857 10 10		1 9	10	103,167
1882	6,115 17 3		3,440 0 0		9,555 17 3		1 7	11	100,774
1883	6,529 6 6		3,400 15 0		9,930 1 6		1 5	8⅜	148 908
1884	6,843 8 5		3,660 5 0		10,503 13 5		1 4	11	98,329
1885	6,547 9 2		4,243 11 0		10,791 0 2		1 4	8¼	137,476
1886	6,505 13 1		4,300 5 0		10,805 18 1		1 3	9½	112,256
1887	6,963 17 6		4,256 10 6		11,220 8 0		1 0	9	121,677
1888	6,872 15 3		5,660 0 0		12,532 15 3		1 0⅜	9½	145,770
1889	6,414 15 7		5,621 0 0		12,035 15 7		1 5	10	101,151
1890	6,403 5 1		5,871 15 0		12,275 0 1		1 5½	9⅜	117,971
1891	6,168 5 10		5,800 0 0		11,968 5 10		1 2⅜	8⅜	170,415
1892	6,380 4 7		5,956 0 0		12,336 4 7		1 3½	10⅜	139,667
1893	7,613 0 0		6,298 0 0		13,911 0 0		1 4¼	1 0	94,610

[1] The Dee Salmon Fishing Improvement Association was formed for the purpose of leasing and removing the upper nets with a view of improving the fishings by allowing a freer passage of fish from the sea to the upper waters. The society spends about £700 per annum increasing netting waters.

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APPENDIX B

A STATEMENT compiled from evidence furnished by Mr. McIVER, factor to the Duke of Sutherland, showing the YIELD of SALMON FISHERIES and the METHODS of CAPTURE pursued from time to time on the WEST COAST of SUTHERLANDSHIRE, comprising the SALMON FISHERY DISTRICTS of the RIVERS KERKAIG, INVER, LAXFORD, and INCHARD.

Year.	Yield of net fishings.	Methods of fishing.	Rentals.			Remarks.
			Inside the estuaries.	Outside the estuaries.	Total.	
	Lbs.		£	£	£	
1845	No statistics	Bagnets on sea coast, nets and cobles, and cruives in rivers.	—	—	400	Although no statistics of the take of fish are extant in the Sutherland Estate offices from 1845 to 1850 inclusive, Mr. McIver was of opinion that such excessive fishing was ruining the fisheries. He was confirmed in this opinion by the fact that the lessee of the net fishings requested permission to give up his lease (which had still some years to run) as the fishings were no longer remunerative. With this request the proprietor readily complied.
1846	,,	,, ,,	—	—	400	
1847	,,	,, ,,	—	—	400	
1848	,,	,, ,,	—	—	400	
1849	,,	,, ,,	—	—	400	
1850	,,	,, ,,	—	—	490	
1851	,,	Angling only	—	—	170	During this period—1851 to 1856—of the disuse of nets the fisheries are said to have completely recovered.
1852	,,	,, ...	—	—	170	
1853	,,	,, ...	135	—	135	
1854	,,	,, ...	135	—	135	
1855	,,	,, ...	135	—	135	
1856	,,	,, ...	135	—	135	
1857	15,204	Net and coble in rivers, no bagnets on coast, or cruives in rivers.	410	—	410	Complaints then being made that there were too many fish in the rivers, a three years' lease was granted to fish by net and coble only, at the mouth of the rivers, over-fishing in the period 1845 to 1850 being attributed to the use of fixed engines.
1858	6,089	,, ,,	410	—	410	

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1859	7,331½	,,	,,	305	—	305	
1860	No statistics	Angling only		300	—	300	The net and coble lease having run out, it was not thought necessary to renew it.
1861	,,	,,	. . . .	300	—	300	
1862	,,	,,	. . . .	300	—	309	
1863	,,	,,	. . . .	300	—	300	
1864	,,	,,	. . . .	345	—	345	
1865	,,	,,	. . . .	335	—	335	
1866	,,	,,	. . . .	350	—	350	
1867	,,	,,	. . . .	330	—	330	
1868	,,	,,	. . . .	330	—	330	
1869	,,	,,	. . . .	340	—	340	
1870	,,	,,	. . . .	350	—	350	
1871	,,	,,	. . . .	375	—	375	
1872	,,	,,	. . . .	295	—	295	
1873	70,975	Bagnets on sea coast No netting or cruives in estuaries or rivers.		360	400	760	In this year a new policy was adopted, viz., bagnets were re-established on the sea coast, whereas no fishing, except by rod and line, was allowed in the estuaries or rivers.
1874	38,658	,,	,,	370	400	770	
1875	44,047	,,	,,	370	400	770	
1876	109,116	,,	,,	370	400	770	
1877	30,568	,,	,,	370	400	770	
1878	48.238	,,	,,	395	550	945	
1879	42.385	,,	,,	395	700	1,095	
1880	49,388	,,	,,	410	700	1,110	
1881	74,129	,,	,,	410	700	1,110	
1882	61,010	,,	,,	420	700	1,120	
1883	101,795	,,	,,	420	700	1,120	
1884	67,900	,,	,,	420	700	1,120	
1885	53,584	,,	,,	345	700	1 045	
1886	41,013	,,	,,	335	700	1,035	
1887	47,540	,,	,,	390	701	1,091	
1888	72,564	,,	,,	440	701	1,141	
1889	54,097	,,	,,	485	601	1,086	
1890	68,072	,,	,,	440	601	1,041	
1891	68,499	,,	,,	440	601	1,041	Fanagmore station not fished after this year. It had yielded on an average 4½ per cent. of the total yield of the fishings.
1892	42,197½	,,	,,	417	601	1,048	
1893	55,357	,,	,,	447	701	1,148	
1894	66,447	,,	,,	472	651	1,123	

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APPENDIX C

SALMON NOMENCLATURE

THERE prevails so much confusion and overlapping in the names given to migratory salmonoids in various parts of the British Isles, that it may be found useful to have a catalogue of these arranged alphabetically under the different stages of the various species for ready reference. Very many of these names I have encountered as local on different rivers; for others I have availed myself of the lists given in Dr. Day's *British and Irish Salmonidæ*.

1. THE SALMON (*Salmo salar*).

FIRST STAGE—*Before first visit to the sea.*

BRANDLING or BRANLING.
BRICEIN (Breekan)—Highland Gaelic.[1]
BLACK FIN.
BLUE FIN.
GINKIN—Ireland.
GRAVEL-LASTSPRING.
GRAVELLING—South of Ireland.
HEPPER.
JERKIN—Ireland.
LASTSPRING.
LEADER—Applied to the larger smolts in parts of Ireland.
MOORGED—Exmoor.
MORGATE—Somersetshire.

[1] There is a great variety of Gaelic terms for all wild animals in different districts of the Highlands.

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PARR—The generally accepted term for the young fish before losing their trout-like colouration.
PINK.
RACK-RIDER—Ireland.
SALMON FRY.
SALMON SPRING—Northumberland.
SAMLET.
SHED.
SKEGGER—Mentioned by Walton.
SKERLING—Wales.
SMELT.
SMOLT—Usually accepted as the term to denote a parr after assuming the silvery sea coat.
SPARLING—Wales.
SPRAG—Northumberland.
SPRAT—Ireland.
SPAWN—Dart, Devonshire.
STREAMER—Tamar, Devonshire.
TECON—Used by Walton.

SECOND STAGE—*On first return from the sea.*

BOTCHER—Severn.
GEALAG-BANAG—Highland Gaelic.
GILSE—Scotland (*g* hard).
GRAWL—North of Ireland and south-west of Scotland.
GRAYLING—Lough Foyle.
GRILSE—Usually accepted as the term for a salmon that has never spawned.
JUDY—Kerry.
MORT—Lancashire.
SALMON PEAL—Southern England.
SPROD—Cumberland.

THIRD STAGE—*Adult salmon before spawning.*

BAGGIT—A female big with spawn.
BRADAN—Highland Gaelic.
CAWG—Welsh for male salmon.
CEMYW-HWYDDELL—Welsh for female salmon.
COCK FISH—A male salmon at spawning time.
GIB FISH—A male spawner (Northumberland).
GILLION or GERLING—A salmon from 8 to 15 lbs. (Severn).
GRAY SCHULE—Heavy, late-running fish in the Tweed.
HEN FISH—A female salmon at spawning time.
KIPPER—A male fish.
MARAN—Welsh.
RAWNER—Gravid fish in spring (Tay).

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RED FISH—Heavy, winter-running fish, without spawn (Caithness).
SHEDDER—A female big with spawn (Severn).
SPRINGER—Spring-running fish (Ireland).
SUMMER COCK—A red male fish at spawning time (Northumberland).

FOURTH STAGE—*Salmon after spawning.*

BLIONACH—Highland Gaelic.
BULL PINK or BULL SALMON—A well-mended kelt (Kirkcudbright Dee).
KELT—The general term for salmon returning to the sea after spawning.
LIGGER—South-west Scotland.
MACK or MARK—North of Scotland.
MOFFATMEN—Tay.
SHIAG—Invernesshire.
SLAT—Ireland.

2. THE SALMON TROUT (*Salmo trutta*).

FIRST STAGE—*Before first visit to the sea.*

BLACKTAIL—Scotland.
BRANDLING.
BURNTAIL—Northumberland.
HERRING SPROD—Cumberland.
HERLING—A term properly denoting the grilse stage of this fish (Scotland).
ORANGE FIN.
PARR.
SILVER GRAY, SILVER WHITE } Scotland.
SMELT SPROD, SPROD } Cumberland.
YELLOW FIN—Scotland.
WHITE FISH—Devonshire.

SECOND STAGE—*After first return from the sea.*

FINNOCK, HERLING, LAMMASMEN, MOUDIE TROUT } Scotland.
SPROD—Cumberland.
WHITENS—Dumfriesshire Esk.
WHITING—Applied in the Tweed district to adult fish.

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THIRD STAGE—*Adult fish before spawning.*

BILL, BULL TROUT } Terms sometimes applied to *Salmo trutta*, but usually reserved for *Salmo cambricus* or *eriox*.
COCKIVIE—Tees.
FORDWICH TROUT—Canterbury.
GEAL-BHREAC—Highland Gaelic.
SALMON TROUT, SEA TROUT } Generally.
SCURF—Tees.
WHITE TROUT—Ireland.
WHITLING—Tweed.

FOURTH STAGE—*After spawning.*

CANDLEMAS GRAY—Cumberland.
KELT SEA TROUT—Generally.

3. THE SEA TROUT (*Salmo cambricus* or *eriox*.)

FIRST, SECOND, AND THIRD STAGES—The various names applied to the parr, smolts, grilse, and kelts of this species cannot be distinguished from those used to denote the equivalent stages in the salmon trout (*Salmo trutta*).

THIRD STAGE—*Adult fish before spawning.*

[redacted]—Cumberland.
BLUE POLL—Wales.
BREAC-MARA—Highland Gaelic.
BULL TROUT—The most general term in the North, except on the Tweed.
PEAL—Southern England.
SEA TROUT—Tweed.
SEWIN—Wales.
WHITE TROUT—Ireland.

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APPENDIX D

Do Salmon Feed in Fresh Water?

Since the preceding pages were written, the Scottish Fishery Board have issued the Report by Messrs. Walter Archer, Mahalanobis and Newbigin, and Drs. Noel Paton, F. Boyd, James Dunlop, Gulland and Lockhart-Gillespie on their investigations on the life-history of the salmon.[1] It is unfortunate that this most interesting treatise, showing the latest result of scientific research on a most obscure subject, should not have been at my disposal before Chapter IX. of the present volume was composed. It is, however, satisfactory to find that, on those points where I found myself most at variance with previous writers and popular opinion, my views, so far as they go, are in harmony with the conclusions of these men of science. On one point only do they seem to indicate that I have been on the wrong tack, namely, in the supposition that there is a to-and-fro migration of salmon between salt and fresh water, independently of direct ascent to the spawning grounds. Against this, they pronounce the evidence they have collected to be very strong.

The whole Report is well worthy of careful perusal by all who concern themselves with the habits of salmon; meanwhile, I am tempted to reprint that part of their conclusions which deals with the question whether salmon feed in fresh water, although, to render justice to these conclusions, the scientific facts on which they rest should be studied also.

"The question of whether salmon feed while in fresh

[1] *Report of Investigations on the Life-History of Salmon.* Glasgow. Printed for Her Majesty's Stationery Office, 1898.

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water has been frequently discussed. Much depends on what is meant by the word 'feeding.' By *feeding*, we here mean not the mere swallowing of material, but the digestion, absorption, and utilisation of that material by the body. That salmon take the fly, minnow, or other shining object in the mouth is no argument as to their feeding in this sense. That they may, and occasionally do, take and swallow worms and other wriggling objects is well known. But the swallowing of a few worms can do but little to make good the enormous changes going on in the fish, even if, when swallowed, they are digested and used.

"The evidence we have adduced may be summarised as follows :—

"1st. There is no reason why salmon should feed during their stay in fresh water. When they leave the sea they have in their bodies a supply of nourishment not only sufficient to yield the material for the growth of ovaries and testes, but to afford an enormous supply of energy for the muscular work of ascending the stream.

"2nd. During the stay of the fish in fresh water the material accumulated in the muscles steadily diminishes, and there is absolutely no indication that its loss is made good by fresh material taken as food.

"3rd. The marked and peculiar degenerative changes which the lining membrane of the stomach and intestine undergoes during the stay of the fish in fresh water shows that during this period the organs of digestion are functionless.

"The absorption of food stuffs is not a mere mechanical process, but is chiefly dependent on the activity of the cells lining the alimentary canal, and in the river these essential cells degenerate and are shed.

"It is a point of no little interest that before the fish again reaches the sea, after spawning, the lining membrane of the alimentary canal undergoes complete regeneration, while the distended condition of the gall bladder seems to indicate that the bile-forming function of the liver is again becoming active.

"4th. The very low digestive power of extracts of the mucous membrane of the stomach and intestine, not only in fish from the upper reaches in which the degenerative changes above referred to have occurred, but

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in fish coming to the mouth of the river and with the lining membrane still intact, seems to indicate that the salmon has practically ceased to feed before it makes for the river mouth. It is to be regretted that, although every effort has been made, no specimen of a salmon stomach containing food has been procured. It is highly desirable that the digestive activity of such stomachs should be compared with the activity of those examined in this series of observations.

"5th. The changes in the bacteria of the alimentary canal also throw light upon the question. Generally speaking, both in the estuary and in the upper reaches, the number of organisms varies directly with the temperature of the water. This is just what might be expected, since the number of organisms in the water largely depends upon its temperature.

"But setting this aside, it is found that while in the gullet there is no great difference between the number of organisms in fish in the estuaries and in fish in the upper reaches, there is a markedly greater number of organisms in the stomach and intestine of fish in the upper reaches. This is especially the case with the putrefactive organisms which are the most readily destroyed by free acids. The greater abundance of these in the upper water fish is strongly indicative of the absence of the free acid which is formed in the stomach of fish while digesting food, and which if present would destroy them.

"Miescher concluded that organisms are less numerous in the fish in the upper waters, but his conclusion is not supported by any evidence.

"6th. Our observations confirm these of Miescher as regards the absence of food from the stomach. In not one of the 104 fish sent to the Laboratory during 1896 and the spring of 1897, was any trace of food found either in the stomach or in the contents of the intestine. That this is not due to rapid digestion has been proved. That it is not due to the fish disgorging the contents of the stomach when caught is shown by the absence of any trace of the indigestible portions of worms, insects, or fish in the intestine.

"To the unscientific mind it is perhaps difficult to realise the possibility of a fast of several months in so

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active an animal as the salmon. But it must be remembered that it is simply a question of supply of energy.

"The food yields energy for work, but if it is taken in excess, it is stored so as to be available at a future period. It has been shown that in the salmon such storage goes on to an enormous extent, and that, even at the end of the fast, there is still plenty of material available to meet any unexpected call for energy. Nor is the salmon exceptional in this respect. Many other cold-blooded animals have the same power of living for very prolonged periods without taking food, while several warm-blooded animals during the rutting season undergo prolonged fasts. It is stated that the male fur seal, after coming to land, may live for over a hundred days without food. During this period he is constantly engaged in struggles with other males, and he finally leaves the shore in a state of extreme emaciation.

"We have thus no hesitation in confirming the conclusions of Miescher-Ruesch that the salmon, at least before spawning, does not feed during its sojourn in fresh water."

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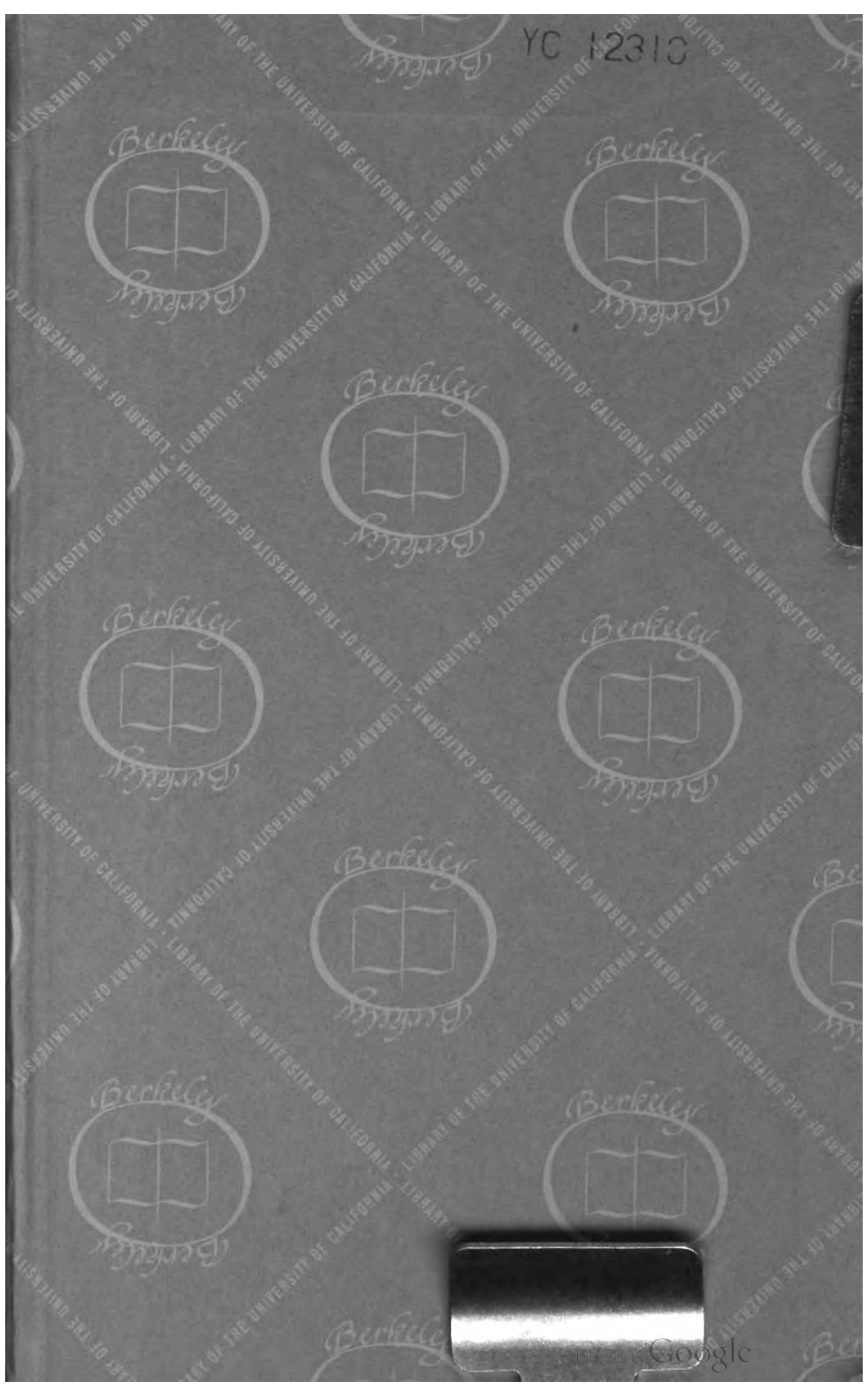

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